

TECHNICAL MANUAL

**GAS CYLINDERS
(STORAGE TYPE)
USE, HANDLING, AND MAINTENANCE
(ATOS)**

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INTRODUCTION

1. GENERAL.

Compressed Gas Cylinders, when constructed to the applicable Department Of Transportation (DOT) specifications and maintained In Accordance With (IAW) DOT Hazardous Materials Regulations may be considered safe for the purposes for which they are intended. Rules and regulations for transporting, handling, use, and storage of compressed gas cylinders for military application in this technical order were extracted from DOT and Defense Logistics Agency (DLA) regulations.

2. PURPOSE.

This technical order is issued to provide information and procedures to be followed in the use, inspections, and handling of storage type Federal Stock Class (FSC) 8120 compressed gas cylinders and cylinder valves by affected contractors and United States Air Force (USAF) in order that all cylinders may be used to the fullest extent. It is of utmost importance that storage type gas cylinders and valves are kept in good condition to aid in the elimination of all possible causes of accidents in the use of compressed gases as well as to conserve gas and equipment vital in all phases of USAF activity.

3. SCOPE.

The provisions of this technical order apply to activities within the Air Force and other associated Department of Defense (DoD) activities who use Air Force/government owned compressed gas cylinders. Compressed gas cylinders in use are of 3 basic types which are identified as high-pressure (up to 6000 psi), low-pressure (below 900 psi), and low-pressure for gas in solution. The differentiating pressure types of cylinders are identified to DOT, Canadian Transport Commission (CTC), or Interstate Commerce Commission (ICC) Designations 3, 4, or 8 with an applicable suffix to identify the particular specification that was used in manufacture of the cylinder. All cylinders purchased and/or requalified for use by DoD and other government activities must be manufactured, inspected, and tested IAW 49 Code of Federal Regulations (CFR) Parts 173 and 178.

NOTE

Instructions contained in this technical order do not apply to aircraft cylinders or to fire extinguishers. Reference applicable technical order for requirements on these cylinders.

4. APPLICABLE REFERENCES.

The following are references in the use, storage, handling, and maintenance of compressed gas cylinders. AFMAN 23-227 (AFJMAN 23-227), DLAI 4145.25, AFMAN 24-204, MIL-STD-1411, MIL-STD-101, MIL-DTL-2, and Title 49, CFR, Parts 173 through 301, and ANSI/Compressed Gas Association (CGA) Pamphlet C-7-2000.

5. LIST OF ABBREVIATIONS.

ATA	Air Transport Association
CFR	Code of Federal Regulations
CGA	Compressed Gas Association
CTC	Canadian Transport Commission
DGSC	Defense General Supply Center
DLA	Defense Logistics Agency
DMPD	Defense Medical Purchase Description
DoD	Department of Defense
DOT	Department Of Transportation
DPD	Defense Property Disposal
DPSC	Defense Personnel Support Center
EOD	Explosive Ordinance Disposal
FSC	Federal Stock Class
IATA	International Air Transport Association
ICC	Interstate Commerce Commission
NFPA	National Fire Protection Association
NSN	National Stock Number
OPR	Office of Primary Responsibility
STANAG	NATO Standardization Agreement
USAF	United States Air Force

CHAPTER 1

CHARACTERISTICS OF CYLINDERS

1.1 GENERAL.

Compressed gas cylinders over the years have been purchased using many different procurement documents. The type, design, size, and capacity normally depend on the commodity of gas and the amount that is desired to be shipped in 1 cylinder. It may be necessary to occasionally identify a cylinder to exact specifications for a specific application in or with an end item or weapon system. The current method of procurement stipulates that all cylinders be processed using military or federal specifications and standards to provide standardization in the cylinder program. These documents continually are updated to reflect the new requirements of state-of-the-art applications. However, since the cylinder is a non-expandable item and is continually cycled into and out of various applications, methods must be established for its accountability and reconditioning.

1.2 CYLINDER TYPES.

Compressed gas cylinders in use by Department of Defense (DoD) activities and other government activities are of 3 basic types which are identified as high-pressure, low-pressure, and low-pressure for gas in solution. The differentiating pressure types of cylinders are identified to Department Of Transportation (DOT), Canadian Transport Commission (CTC), or Interstate Commerce Commission (ICC) Designations 3, 4, or 8 with an applicable suffix to identify the particular specification that was used in manufacture of the cylinder. All cylinders purchased and/or requalified for use by DoD and other government activities must be manufactured, inspected, and tested In Accordance With (IAW) 49 Code of Federal Regulations (CFR) Parts 173 and 178. Each person who represents that he manufactures or performs retesting as outlined in 49 CFR must be approved by and have a registration number issued by DOT.

- a. The cylinders used throughout DoD that are managed by DGSC are cylinders identified by DOT, CTC, or ICC Specifications 3, 3A, 3AA, 3AL, 4, 4A, 4AA, 4B, 4BA, 4BW, 8, and 8AL.
- b. In most instances, depending on product and application, cylinders of a given basic type are interchangeable. For instance, Specification 3A and 3AA cylinders are interchangeable when the non-shatterable characteristic is not a prime factor in their use. Specifications 4B, 4BA, and 4BW are also interchangeable when the materials of construction are compatible with the product used.

- c. In the military supply system, the Specification 4A and 4AA cylinders are used exclusively for anhydrous ammonia and should not be substituted for or by any other Specification 4 cylinder unless such use is approved by Defense General Supply Center (DGSC).
- d. The Specification 8 and 8AL cylinders are packed with a porous material that, even when the cylinders are empty, makes them much heavier than would normally be expected. These cylinders are used exclusively for acetylene and no other product may be used with these cylinders.

1.3 CYLINDER SIZES.

The physical dimensions (i.e., diameter and height) of the various types of cylinders in the DoD inventory are continuously changing to meet new requirements; however, the actual volumetric capacity has not. For this reason, over the years the government has accumulated varying size cylinders under a specific type with basically the same capacity. This is especially true in the DOT/ICC 4 and 8 cylinders.

- a. Most of the Specification 4 and 8 cylinders that are not designated for a specific end use in which the size is critical may be identified only as cylinders with the same capacity for a given gas under one National Stock Number (NSN).
- b. For other than transportation purposes, height of cylinders is always measured from the bottom to the top of the neckring or spud; valves or cylinder caps are not to be included in measuring the height.

1.4 CYLINDER PRESSURES.

- a. Compressed gas cylinders are designed and constructed to meet the specific needs of storing, using, and transporting compressed gases and liquids safely. All cylinder designs and/or types are regulated and manufactured IAW CTC and DOT Specifications. Each cylinder has been marked with a CTC, DOT or ICC Specification and working (service) pressure, which is stamped (not stenciled) into the shoulder of the cylinder. The cylinder selection for use with a product is based on the stabilized pressure of the product at an ambient temperature of 130°F which shall not exceed 1.25 times the service pressure of the cylinder, and the materials used in the construction of the cylinder are compatible with the product. Exceptions apply

for certain charge cylinders depending on the product, such as acetylene, liquefied nitrous oxide, or liquefied carbon dioxide.

- b. Cylinders of the same type manufactured to the same Specification (3A, 3AA, 3AL, 4B, 4BA, or 4BW) with a greater service pressure than is necessary for the designated product may be substituted for the specified cylinder of lower pressure provided the prescribed valve and cylinder characteristic requirements for the product and application are met. Service pressure of cylinders filled by weight is immaterial provided it meets or exceeds the minimum rated pressure prescribed by law for that product. (Example: Specification 3AA2265 cylinder can be used in lieu of a 3AA1800 cylinder for charging with carbon dioxide; however, a 4B240 cannot be used in lieu of a 4B400 cylinder when charging with argon.) Table 1-1 provides the prescribed cylinder and its minimum working pressure for each compressed gas that is filled by weight.

1.5 WORKING PRESSURE TABLE.

- a. Every effort should be made to identify a cylinder to a NSN using Table 1-1 before referring cylinders to DGSC for identification.
- b. High-pressure cylinder Specifications 3A and 3AA with service pressures of 1800 psig or greater will vary in capacity based on the service pressure and the product.
- c. Cylinders with Specifications 3A2000, 3AA2000, 3A2200, and 3AA2200 were purchased in the past for helium service. NSNs were assigned as necessary. It has been necessary to convert some of these cylinders to other services where a specific NSN does not apply. The following cylinders have been consolidated: 3A2000 with 3A2015, 3AA2000 with 3AA2015, 3A2200 with 3A2265, and 3AA2200 with 3AA2265. New NSNs were not established for this consolidation.

Table 1-1. Gases Minimum Working Pressure

Gas	CTC/DOT/ICC Specification	Minimum Services Pressure
Acetylene	8, 8AL	250
Air, for Human Respiration (oil free)	3A, 3AA, 3AL	1800
Air, Industrial (oil tolerant)	3A, 3AA, 3AL	1800
Ammonia, Anhydrous	4, 4A, 4AA	480
Argon	3A, 3AA, 3AL	1800
Bromotrifluoromethane	4B, 4BW, 39	400
Bromotrifluoromethane	3A, 3AA	1800
Butane	4B, 4BA, 4BW	240
Butane/Propane	4B, 4BA, 4BW	240
Carbon Dioxide	3A, 3AA	1800
Carbon Monoxide	3A, 3AA, 3AL	1800
Chlorine	3, 3A, 3AA	480
Chlorodifluoromethane	4B, 4BA, 4BW, 39	240
Chlorotrifluoromethane	3A, 3AA, 3AL, 39	1800
Chlorodifluoromethane and Chloropentafluoroethane Mixture	4BA, 4BW, 39	240
Cyclopropane	4B, 4BA, 4BW, 39	225
Dibromodifluoromethane	4B, 4BA, 4BW	300
Dichlorodifluoromethane	4B, 4BA, 4BW, 39	225
Dichlorodifluoromethane and Difluoroethane Mixture	4B, 4BA, 4BW	225
Dichlorotetrafluoroethane	4B, 4BA, 4BW	225
Dimethylamine, Anhydrous	4B, 4BA, 4BW	225
Ethylene Oxide	4B, 4BA	240
Ethylene Oxide and Carbon Dioxide Mixture	3A, 3AA	1800

Table 1-1. Gases Minimum Working Pressure - Continued

Gas	CTC/DOT/ICC Specification	Minimum Services Pressure
Ethylene Oxide and Dichlorodifluoromethane Mixture	3A, 3AA, 3B, 4B, 4BA, 4BW, 39	225
Ethyl Chloride	4B, 4BA, 4BW	225
Helium (Type I, gas)	3A, 3AA, 3AL	1800
Hexafluoroethane	3A, 3AA	1800
Hydrogen	3A, 3AA	1800
Hydrogen Chloride, Anhydrous	3A, 3AA	1800
Hydrogen Sulfide	3A, 3AA, 3AL	480
Methyl Acetylene-Propadiene (MAPP)	4B, 4BA, 4BW	240
Methyl Bromide	4B, 4BA, 4BW	225
Methyl Chloride	4B, 4BA, 4BW	225
Neon	3A, 3AA, 3AL	1800
Nitrogen	3A, 3AA, 3AL	1800
Nitrous Oxide	3A, 3AA, 3AL	1800
Oxygen	3A, 3AA, 3AL	1800
Phosgene	3A, 3AA, 3AL	1800
Propane	4B, 4BA, 4BW	240
Sulfur Dioxide	4B, 4BA	225
Sulfur Hexafluoride	3A, 3AA, 3AL	1800
Trichlorofluoromethane	4B, 4BA, 4BW	225
Trichlorotrifluoromethane	4B, 4BA, 4BW	225
Trifluoromethane and Tetrafluoromethane Mixture	3AA, 3AL	1800
Xenon	3A, 3AA, 3AL	1800

CHAPTER 2

GENERAL PRECAUTIONS IN THE USE AND HANDLING OF COMPRESSED GAS CYLINDERS

2.1 PURPOSE.

The purpose of this chapter is to give instructions and general requirements and precautions for safe handling and use of compressed gas cylinders. It should not be assumed that every safety precaution is contained in this chapter. The best safety precaution is to ensure that cylinder handlers and product users are adequately trained. Personnel selected to work with compressed gases and cylinders shall be properly trained in order to develop a thorough knowledge of the characteristics of compressed gases, cylinders, valves, and markings. The minimum standard shall consist of a thorough comprehension of the applicable parts of the following: AFI 91-301, AFMAN 23-227(I), AFMAN 24-204(I), MIL-DTL-2, MIL-STD-101, MIL-STD-1411, NFPA 55, T.O. 42B5-1-2, and 49 CFR 173-301.

2.2 GENERAL HANDLING INSTRUCTIONS FOR USERS.

a. Identification of Cylinders – filled compressed gas cylinders will be identified with 2 tags (DD Form 1574). One tag will identify the content of the cylinder and the other will identify the cylinder. This is in addition to the DOT label identification. Pressure of cylinder contents (or weight for gases shipped in a liquid state) should always be checked by using personnel when first beginning to use a newly issued cylinder, to determine product and whether or not cylinder is fully charged. Low-pressure or weight is an indication, in most instances, of a defective valve; therefore, a cylinder received in this condition shall be noted so that after its contents have been used, it shall be tagged with a DD Form 1577-2 stating that the valve may be leaking or its content was short on the last filling. If, in using the gas, it appears that the inside of the cylinder contains foreign or loose material, this condition will be annotated on the reverse side of the tag. When the cylinder is depleted, the DD Form 1574 tag pertaining to the content will be removed, and the cylinder identification DD Form 1574 will be over stamped MT to indicate that it has been exhausted to 5 – 38 psig pressure. Do not remove DOT label. When a cylinder has been identified as unserviceable, a DD Form 1574 will be removed and a DD Form 1577-2 attached. This is the responsibility of the using activity.

b. Moving and Lifting of Cylinders.

- (1) Cylinders will never be used as rollers, supports, or for any purpose other than for the transportation of compressed gases, even though they are empty. Use of cylinders for any unauthorized purpose may result in valve damage or oil and dirt contamination.
- (2) Cylinders shall not be dragged or slid. Suitable trucks with provisions for holding cylinders securely in position will be used.
- (3) Cylinders will never be handled otherwise without first removing regulators and manifolding accessories and replacing valve outlet cap and cylinder valve protection cap.
- (4) Cylinders shall not be dropped or permitted to strike against each other or other surfaces violently. Magnets shall not be used for lifting cylinders.
- (5) Ropes, chains, or slings shall not be used to suspend cylinders unless provisions at time of manufacture have been made on the cylinder for appropriate lifting attachments.

c. Handling and Storing of Cylinders.

- (1) Cylinders must be protected against excessive rise and fall of temperature. They will be stored inside wherever possible. If stored in the open, they must be protected from extreme weather conditions.
- (2) Compressed gas cylinders shall not be subjected to an atmospheric temperature above 130°F (54.4°C). Flames, sparks (including static sparks), or ignition from any source must not come into contact with hose or cylinders. Do not store cylinders near radiators, furnaces, stoves, or other sources of heat.
- (3) Compressed gas cylinders shall not be stored near highly combustible materials such as oil, gasoline, waste, etc. Unless otherwise specified in this technical order, they shall be separated from these and other combustible materials by a minimum of 20 feet or isolated by a barrier of noncombustible material at least 5 feet high that has a minimum fire resistance rating of ½ hour.
- (4) Cylinders stored in the open must be protected from accumulation of ice and snow. If they become frozen, they should be thawed out at

room temperature, or thawed out with water at temperature not exceeding 130°F (54.4°C). Do not use a steam hose to thaw them out as fusible safety plugs may melt and allow discharge of the cylinder content. Pry bars must never be used under valves or valve caps to pry cylinders loose when frozen or fixed to the ground.

- (5) Cylinders shall not be placed where they might become part of an electrical circuit or stored near live electric wires or rails of electrical equipment.
- (6) Cylinders will not be stored in an area continually damp, or stored near salt or corrosive chemicals or fumes of any kind as cylinders will become rusty and the valve caps will stick.

2.3 GENERAL PRECAUTIONS.

- a. If possible, keep empty cylinders separated from full cylinders.
- b. Compressed gases shall not be used where the cylinder may be contaminated by the feedback of other types of gases used on a system. Suitable devices should be used to prevent this.
- c. Compressed gas shall not be used to dust off clothing. This may cause serious injury to the eyes or body, or create a fire hazard.
- d. The user shall keep cylinder valves closed at all times (charged or empty) except when the cylinder is in use. IN USE is defined as WHEN GAS IS FLOWING FROM THE CYLINDER, WHEN THE CYLINDER IS MAINTAINING PRESSURE IN A SUPPLY LINE OR WHEN THE CYLINDER IS STANDING BY DURING AND BETWEEN OPERATIONS UTILIZING THE GAS.
- e. Care will be taken to protect cylinders from any object which might cut or damage their surfaces. Cylinders will not be stored at a place where heavy moving objects may strike or fall on them.
- f. Valve protection caps will always be installed except when cylinders are connected to equipment. Cylinders that are so constructed with recessed control valves do not require valve protection caps.
- g. A flame shall not be used for detection of any gas leaks. A leak detector, soapy water, or other suitable solution shall be used.

2.4 GENERAL INSTRUCTIONS ON CYLINDER APPLICATION AND INSTALLATION.

- a. The user responsible for the handling of the cylinder and connecting it for use shall check the identity of the gas by reading the proper tags and labels. If cylinder contents cannot be identified, it will be returned to supply. Cylinder color coding shall not be relied upon for content identification.
- b. Cylinder valves will always be opened slowly to prevent sudden discharges of gas. Valve outlets shall be pointed away from the operator's body and other persons. Valves fitted with handwheels should be operated by hand only; those requiring use of a wrench should be operated only with properly fitting wrench or key. It must be kept ready for instant use while gas is being used from cylinder. Wrenches or hammers must not be used to open or close cylinder valves equipped with handwheels. The use of such tools on valves will damage the valve seat material, allowing the gas to escape. Enough pressure can be exerted with a person's hand to close a valve equipped with a handwheel without the use of a wrench. If valve cannot be totally closed by hand, the gas will be permitted to escape to the free atmosphere and the valve will be inspected and repaired as necessary.
- c. Compressed gas from any cylinder shall not be used without reducing the pressure through a regulator or throttle valve intended for this purpose. Reduction in pressure shall not be accomplished by throttling through the cylinder valve. Particular care must be exercised in checking that threads on regulators or unions are the same as those on the valve being used. If fittings are hard to turn, they must not be forced, but checked to be certain that they are of the correct thread and type, and are not damaged. Threads must be of the same type and have the same number of threads per inch to engage properly and produce a satisfactory seal.
- d. Before connecting the coupling or pressure regulator to the cylinder valve, the valve shall be CRACKED OPEN or turned approximately ¼ turn and closed immediately. This clears the valve ports of dust, dirt, or moisture elements which would otherwise enter the regulator. Particular care should be exercised when opening a valve around or near welding, sparks, flame, or any other possible source of ignition or in a closed room.

- e. After attaching regulator to cylinder valve, check that adjusting screw on regulator is released before opening the cylinder valve. Fully, but slowly open cylinder valve each time gas is used from cylinder.
- f. Connections to piping, regulators, and other appliances shall be kept tight to prevent leakage. Where hose is used, it shall be kept in good condition. Regulators, pressure gages, hoses, and other fittings will not be used interchangeably with similar equipment used with other gases having different chemical properties. As an example, only pressure regulating devices approved for use with oxygen shall be used in oxygen service.
- g. The user shall secure cylinders while connecting to a portable welding, cutting, brazing, or portable utilization equipment to prevent them from being knocked over. Metal chains, straps, braces, or other restraining devices will be used. Nylon straps cannot be used on flammable gases.
- h. Before a regulator is removed from a cylinder, the cylinder valve will be closed and all gas released from the regulator.

2.5 CYLINDERS AND CYLINDER CONTENTS.

- a. Compressed gases should not be transferred from one cylinder to another cylinder except by a gas manufacturer or gas distributor who compresses the gases into cylinders by compressors or pumps. There are exceptions to this rule. Any operation that requires transferring gases between cylinders should be evaluated by Base Safety to ensure that it is being performed safely and properly.
- b. Compressed gas cylinders must not contain gases capable of combining chemically with each other or with the cylinder material so as to endanger its integrity.
- c. The user shall not repair or alter cylinder or cylinder valves. For maintenance of cylinders and cylinder valves, reference MIL-STD-1411.
- d. The user shall not change, modify, tamper with, obstruct, or repair the pressure-relief devices in cylinder valves or in cylinders.
- e. The prescribed markings stamped into cylinders shall not be removed or changed without authority from the DOT.
- f. The user shall not deface or remove any markings, labels, decals, tags, or stencil marks applied by the supplier and used for identification of content. This does not apply to DD Form 1574 or 1577-2 attached to cylinders.

2.6 GENERAL PRECAUTIONS IN CASE OF ACCIDENTAL DISCHARGE OF GASES.

- a. Acid and Alkaline Gases – precautions shall be taken to avoid contacting the skin or eyes with acid or alkaline gases. Goggles or faceshields, rubber (or other suitable chemically resistant material), gloves, and aprons shall be worn.
 - (1) Personnel handling and using acid and alkaline gases shall have available for immediate use in emergencies, self-contained breathing apparatus. Gas masks may be used only under conditions where the concentration of the acid or alkaline gas in excess of the gas mask rating will not be encountered and where the oxygen content of the atmosphere is not less than 19% by volume.
 - (2) Acid and alkaline gases should be utilized in a well-ventilated area.
 - (3) The following is a partial listing of the acid and alkaline gases: Ammonia, Boron Trifluoride, Chlorine, Dimethylamine, Ethylamine, Fluorine, Hydrogen Bromide, Hydrogen Chloride, Hydrogen Sulfide, Methylamine, Nitrosyl Chloride, Sulfur Dioxide, and Trimethylamine.
- b. Highly Toxic and Flammable Gases – personnel handling and using highly toxic gases shall have available for immediate use in emergencies, gas masks or self-contained breathing apparatus.
 - (1) A broken valve or defective cylinder may result in an area being filled with toxic and/or explosive gases. Where it is necessary to rescue personnel overcome in such places, the rescuers may themselves be overcome unless precautions are taken. Rescuers should not enter contaminated areas unless equipped with approved self-contained breathing apparatus or supplied air (hose mask with blower or air-line respirator) breathing apparatus. The use of the gas mask is limited to atmosphere containing more than 16% oxygen and not more than 2% of most toxic gases. It is emphasized that the proper gas mask canister be used for the intended purpose. The above equipment must be fitted with full face pieces. For additional information on application of respiratory protective devices, refer to AFOSH STD 48-137. Ventilation will be applied as soon as practicable by opening doors and windows.

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- (2) Exposed personnel will be removed to fresh air, and medical aid will be summoned.
- (3) Remove the leaking cylinder outdoors to a well-ventilated location or place under exhaust ventilating system suitable for the product. If the gas is flammable or toxic, secure the area, contact Base Emergency personnel, and place appropriate warning signs.
- (4) Before using a highly toxic gas, read all the label and information associated with the use of the particular highly toxic gas. All personnel working in the immediate area where these gases are handled shall be instructed as to the toxicity of the gases and methods of protection against harmful exposure and first aid treatment in case of exposure.
- (5) The following are commonly handled highly toxic gases: Carbonyl Fluoride, Chlorine, Di Borane, Fluorine, Germane, Hydrogen Cyanide,

Hydrogen Selenide, Nickel Carbonyl, Nitric Oxide, Nitrogen Dioxide, Ozone, Phosgene, Phosphine, and Stibine.

- c. Inert Gases – inert gases, such as Argon, Carbon Dioxide, Helium, Krypton, Neon, Nitrogen, and Xenon, are simple asphyxiants which can displace the oxygen in air necessary to sustain life and can cause rapid suffocation due to oxygen deficiency. Self-contained breathing apparatus or air-line masks shall be worn in areas containing an oxygen-deficient atmosphere where the oxygen concentration is less than 19% by volume.

NOTE

Do not take chances! If doubt about proper handling of a compressed gas or cylinder exists in your mind, check first with someone who knows.

CHAPTER 3

CHARACTERISTICS AND SPECIFIC PRECAUTIONS TO OBSERVE IN THE USE OF EACH TYPE OF GAS

3.1 PURPOSE.

The purpose of this chapter is to describe each type of gas. Specific precautions on hazards associated with each individual gas are included.

3.2 GENERAL.

Personnel having the responsibility of storing, handling, and/or using compressed gases and gas cylinders must have knowledge of the characteristics and hazards associated with each individual gas.

3.3 TYPES OF GASES.

- a. Acetylene (C₂H₂) (flammable) – acetylene is a colorless gas with a peculiar garlic-like odor. It is highly flammable and has a wide explosive range when mixed with air or oxygen. Acetylene is lighter than air and is dissolved in acetone when shipped. Although pure acetylene does not present any unusual health hazards, the impurities in acetylene are toxic and produce a harmful anesthetic effect when breathed; vapors in high concentrations or in enclosed spaces may cause asphyxiation. Acetylene is used for welding and cutting purposes. When connecting and using acetylene cylinders, observe the following precautions:

- (1) For normal operations, acetylene pressures of 15 psig is generally acceptable as a safe pressure limit. However, pressure exceeding 15 psig can be employed providing specialized equipment is used and persons operating such equipment are trained/qualified in this application.
- (2) Acetylene cylinders shall be shipped, stored, and used in an upright position. The reason for this is that in case the valve leaks or is not closed properly, the acetone will not leak out. During use, it is mandatory that the cylinder is in an upright position to prevent drawing out acetone.
- (3) In the event that an acetylene cylinder has been laid on its side, regardless of the reason, it shall then stand in an upright position for a minimum of 2 hours prior to use to avoid the possibility of drawing out acetone.
- (4) Do not stand in front of regulator and gage faces when opening valve. Acetylene valves will be opened slowly and not more than 1½ turns. Usually ½ turns or less is sufficient for welding purposes.
- (5) Do not use acetylene through any device equipped with a cutoff valve unless the pressure has been reduced through a regulator.
- (6) Always keep the wrench or handwheel used for opening the cylinder valve on the valve spindle when cylinder is in use. Always use the wrench specifically designed for this purpose.
- (7) Do not use the recessed top of a cylinder as a tool rack.
- (8) Do not use improvised or **HOMEMADE** acetylene generators.
- (9) Use caution to prevent acetylene cylinders from coming into contact with electrical circuits or electric welding equipment.
- (10) Keep sparks and flame away from acetylene cylinders. Under no circumstances will any flame be allowed to come into contact with safety devices.
- (11) Do not test for acetylene leaks with a flame; use soapy water.
- (12) Never attempt to transfer acetylene from one cylinder to another.
- (13) Always keep valves on empty cylinders closed, install the valve protection cap, if there is provision for one.
- (14) In the event a valve outlet becomes clogged with ice, thaw it out with warm, not boiling water.
- (15) The acetylene gas remaining in a cylinder is indicated by weight, not by pressure. For checking purposes, the amount is determined by weighing the cylinder (without the cap). The weight in excess of the tare weight stamped on the cylinder is the amount of acetylene remaining in the cylinder.
- (16) Always close the cylinder valve when the work is finished. Be sure the cylinder valve is closed and all gas released from the regulator before removing the regulator from a cylinder.

- (17) Care should be taken to prevent acetylene leakage. Connections should be kept tight and accessories (hoses) maintained in good condition. Points of suspected leakage should be tested by covering them with soapy water. A leak will be indicated by bubbles of escaping acetylene passing through the soap film. For leak test instructions, reference Chapter 7.

b. Air, Compressed (nonflammable) – air is a colorless, odorless, and tasteless gas. It is made of a mixture of oxygen and nitrogen as the major components. Air, like any gas, is capable of being compressed and shipped in a gaseous state. The most common method of producing compressed air for human respiration is by the compression of normal atmospheric air. This is accomplished by various types of compressors which take ambient air and compress it to the desired working pressure. Water pumped air (water lubricated compressor) is principally used for experimental purposes and in breathing equipment. The terminology WATER PUMPED AIR denotes air that is fit for human respiration. Oil pumped air (oil lubricated compressor) is utilized in numerous types of equipment that require pressurized air. The terminology OIL PUMPED AIR denotes air that is usually not fit for human respiration, and is principally used whenever pressurized air is required. The following precautions will be adhered to in use and handling of compressed air cylinders:

- (1) Compressed air cylinders should not be dropped, dragged, rolled, or allowed to strike each other or to be struck violently. Such treatment can result in damage which could cause failure of the cylinder or valve allowing violent release of the gas with possible damage to property and injury to personnel.
- (2) Compressed air cylinders (when pressurized) should not be exposed to any source of heat which could cause any part of the cylinder to reach a temperature exceeding 125°F. A cylinder which has been exposed to fire or excessive heat must be removed from service until it has been reinspected, retested.
- (3) Air under pressure, from a hose line or cylinder valve, must not be allowed to impinge on any part of the body. A small jet of air under pressure can penetrate the skin and cause severe injury.
- (4) The use of compressed air to blow dust or chips from the hair, clothing, work benches, or machines is hazardous and is prohibited.

c. Ammonia (NH₃) (nonflammable) – ammonia is a colorless gas with a pungent characteristic odor, which liquefies at -33.7°C (-28.7°F). It is very

soluble in water. It is much lighter than air and flammable only when heated to 1200°F (648.8°C). It normally does not support combustion; however, it is explosive when mixed with air in proportions of 1 volume of ammonia to 2 volumes of air, and much more so when mixed with oxygen. Ammonia is an irritant and, when breathed in small concentrations, causes acute distress by attacking the tissues of the lungs. Exposure to large concentration is fatal. Ammonia is shipped in a liquid state. Anhydrous ammonia is used as a refrigerant. The following precautions shall be adhered to when using and handling ammonia:

- (1) Always store ammonia cylinders in a cool, dry place.
- (2) The amount of ammonia in cylinders is determined by weight, not pressure. The best way to determine if an ammonia cylinder is empty is to weigh it, without the protection cap, and compare the weight with the tare weight stamped on the cylinder.
- (3) The valve protection caps should be in place on either full or empty cylinders when they are being moved. When in use, this requirement does not apply.
- (4) Immediately after the system has been charged or serviced, or the cylinder emptied, the cylinder valve should be closed and the outlet connection cap should be placed on the valve outlet connection (wrench tight) to prevent dirt from entering and damaging the threads.
- (5) For leak test instructions, reference Chapter 7.

d. Argon (nonflammable) – argon in cylinders is a liquid (Grade I) or a gas (Grade II). Argon is a colorless, odorless, inert gas, somewhat heavier than air. It is nontoxic and will not support combustion. Due to its ability to displace air, it is a simple asphyxiant. The gas is seldom prepared in the pure form since it is usually extracted from air by the fractionation process and therefore carries small percentages of other gases such as krypton, xenon, neon, etc. The boiling point of Argon is -302°F (-185.5°C). It is used primarily for special welding processes. Contact with the liquid or high-pressure gas may cause frostbite or serious eye damage.

e. Carbon Dioxide (CO₂) (nonflammable) – carbon dioxide is colorless with a slightly pungent odor with an acid taste in commercial (solid) form. It will not support respiration although it is not poisonous. It is much heavier than air and is nonflammable. Gaseous CO₂ can be transferred from one cylinder to another provided sufficient elevation is given to the cylinder containing the carbon dioxide.

A pump can also be used to transfer carbon dioxide. Carbon dioxide is transported in a liquid state. Because it does not form explosive mixtures with oxygen or air, the chief use of carbon dioxide is as a fire extinguishing agent; it is also used as a means for inflation of life rafts and safety vests and as a propelling or an expelling agent. Other uses are soft drink carbonation and refrigeration. The storage pressure in the cylinders varies with the ambient temperature, cylinder pressures being approximately 835 psi at 70°F (21.1°C) to 1450 psi at 100°F (37.8°C). With the aid of refrigeration, the temperature of the CO₂ is maintained at approximately 0°F (-17.8°C), and the pressure at approximately 285 psi; therefore, lighter weight storage containers can be used in buildings and on fire trucks. One pound of liquefied gas expands to approximately 9 cubic feet in the gaseous state. The freezing point is approximately -110°F (-80°C) at normal atmospheric pressure. The following precautions will be adhered to in use and handling carbon dioxide cylinders:

- (1) Do not enter an area filled with carbon dioxide without first providing ventilation. If this is not practicable, wear approved self-contained breathing apparatus and have assistance available just outside the area.
 - (2) Contact with carbon dioxide liquid or high-pressure gas may cause frostbite, burns, or serious eye damage.
 - (3) Insure that all safety devices are in operating condition when handling carbon dioxide cylinders.
 - (4) The amount of carbon dioxide in a cylinder is determined by weight.
 - (5) Although all gases in cylinders must never be allowed to reach a temperature exceeding 130°F, carbon dioxide cylinders become extremely dangerous when heated and should never be stored or used near furnaces, radiators, or any other source of heat.
- f. Carbon Monoxide (CO) (flammable) – carbon monoxide is an extremely flammable gas. When pure, it is odorless and colorless and does not give warning of its presence; therefore, cylinders must always be used and stored in a well-ventilated area away from sources of ignition or oxidizing gases. Prolonged breathing of low concentrations may cause headaches. Breathing of high concentrations, particularly in enclosed spaces, may be fatal. It is lighter than air and is shipped in a gaseous state. It is principally utilized in testing CO signal detectors.
- (1) Carbon monoxide gas cylinders require special precautions in storage and usage. Carbon monoxide under certain conditions can cause stress corrosion. When packaged in the pure and dry state, there is little affect on the cylinder walls. However, if the cylinder is permitted to become contaminated with moisture and other impurities, stress corrosion can take place, resulting in possible cylinder failure.
 - (2) Carbon monoxide inventories should be so regulated that the oldest cylinders are used first and storage time does not exceed 1 year.
- g. Chlorine (Cl₂) (nonflammable) – chlorine is a greenish-yellow gas with a highly disagreeable, pungent, suffocating, irritating odor. It is 2.49 times as heavy as air and nonflammable. It is shipped in a liquid state and will not support combustion. It is very toxic and when inhaled in small quantities, it produces symptoms of a hard cold. If inhaled in larger quantities, serious and possibly fatal effects will result. The following precautions will be adhered to in use and handling of chlorine:
- (1) Chlorine will be used only by experienced and properly trained personnel.
 - (2) Where chlorine is used, gas masks will be furnished equipped with canisters approved for protection against chlorine.
 - (3) Good ventilation will be maintained where chlorine is used as some gas always escapes when pipes are disconnected.
 - (4) Chlorine leaks can be located by using a cloth wet with aqua ammonia. Ammonia in the presence of chlorine produces white fumes.
 - (5) Chlorine cylinders will be used in an upright position. Amount of chlorine in cylinder is determined by weight.
 - (6) For leak test instructions, reference Chapter 7.
- h. Dichlorodifluoromethane (nonflammable) (refrigerant) (Freon-12) – dichlorodifluoromethane is often called by the trade name refrigerant Freon-12. It is a colorless, odorless gas. It is nonflammable, nonexplosive, and does not support combustion. Freon-12 is an asphyxiate and therefore is considered toxic. Like other refrigerants, it replaces oxygen in a confined place. Freon-12 should be used only in well-ventilated areas. If the refrigerant is required to be used in confined spaces, prior approval and guidance of Bio-Environmental Engineer and Safety Offices must be obtained. As a minimum, self-contained breathing apparatus or air-line respirator must be

worn when working with Freon-12 in confined spaces. Freon-12 is shipped in a liquid state. It is used as a refrigerant and as a means for propelling disinfectant compositions found in the aerosol units supplied for this purpose. The following precautions will be adhered to in use and handling of dichlorodifluoromethane (Freon-12):

- (1) The cylinder valve should be closed immediately after the system has been charged or cylinder emptied.
 - (2) As soon as the cylinder valve is closed and disconnected from the refrigerating system being serviced, the outlet connection cap should be placed on the valve outlet connection (wrench tight) to prevent dirt from entering and damaging the threads. Valve protection caps should be carefully screwed in place before placing the cylinder in storage.
- i. Helium (He) (nonflammable) – helium is a colorless, odorless, tasteless, inert and nontoxic gas. It is much lighter than air, being the second lightest of all gases, and is difficult to liquefy. Helium is nonflammable and does not support combustion. Mixtures of helium and oxygen are used for breathing under certain conditions with no harmful effects. Under uncontrolled conditions, helium may dilute ambient oxygen to unsafe levels and create an asphyxiant atmosphere which could cause suffocation and death. It is best to use helium in well-ventilated areas. Precautions should be taken when used in confined spaces to ensure oxygen is not depleted. It is used extensively in the welding industry as an inert shielding gas for arc welding. It is also used in the field of cryogenics and for electronic tubes. Helium is used as a trace gas for leak detection. Helium is normally shipped in a gaseous state. Helium is an inert gas stored in high-pressure cylinders and creates no special problem in handling. The amount of helium in the cylinder is determined by pressure.
- j. Hydrogen (H₂) (flammable) – hydrogen is a colorless, odorless, and tasteless gas which liquefies at -253°C (-423°F). It is much lighter than air and highly flammable when mixed with air or oxygen. Hydrogen has a wide explosive range when mixed with air or oxygen. Mixtures with air in proportions of less than 10% (by volume) of hydrogen will burn with an almost invisible blue flame. Mixtures of hydrogen and air containing between 10 and 63% of hydrogen by volume will explode when brought into contact with a bright red heat. Hydrogen is not poisonous if breathed. It is shipped in a gaseous state. It is used in welding, underwater cutting operations, and in meteorological equipment. The following precautions will be adhered to in use of hydrogen:
- (1) Hydrogen cylinders must be stored in a well-ventilated space. Hydrogen and other combustible materials will not be stored in the same room with oxygen or compressed air. They should be separated by fire resistant walls when stored inside.
 - (2) Because hydrogen is highly flammable, all sparks and flames must be kept at a safe distance, a minimum of 50 feet.
 - (3) Never use a flame to detect hydrogen leaks, use soapy water. Linseed oil may be used in freezing weather.
 - (4) The amount of hydrogen in a cylinder is determined by pressure.
- k. Liquefied Petroleum (LP) Gases (flammable) – the liquefied petroleum gases are butane, isobutane, propane, propylene (propene), butylenes (butenes) as defined by the DOT. They are flammable, colorless, and noncorrosive. Most are odorless and an odorant, such as ethyl mercaptan, is added to give warning of the presence of gas. In low concentrations they have an anesthetic effect, and in high concentrations in enclosed spaces may cause asphyxiation. The most used LP gas by Air Force activities is propane. It is flammable when mixed with air in certain proportions and under favorable conditions may, when ignited, cause explosions. Propane is primarily used as a heating gas and is shipped in a liquid state. Amount of gas in a cylinder is determined by weight. Because propane is heavier than air, it will seek ground level and settle in pits; therefore, special precautions should be taken by using personnel to prevent gas leakage which may result in injury to other personnel.
- l. Methylacetylene-Propadiene (HC = C-CH₃)-(CH₂ = C = CH₂) (flammable) – methylacetylene-propadiene, MAPP* is a colorless, flammable gas at room temperature and pressure. The gas has a low toxicity level and a strong characteristic odor of garlic, easily detectable at concentrations as low as 100 ppm. MAPP gas vapor causes no adverse response upon local eye or skin contact. Liquefied MAPP gas may cause frost type burns. It is readily liquefied and shipped as a liquefied gas under its own vapor pressure of about 94 psig at 70°F. It is explosive when mixed with air in certain proportions (between 3.4 – 10.8% methylacetylene-propadiene). It is heavier than air and will thus seek ground level. Methylacetylene-propadiene is used in applications which require a high flame temperature such as cutting, welding, and flame hardening.

*MAPP gas is the registered trademark of Dow Chemical Company.

- m. Methyl Bromide (CH_3Br) – methyl bromide is a colorless gas at ordinary temperatures and pressures. In manufacturing methyl bromide, the gas is compressed and put into cylinder containers as a liquid. It is then withdrawn, when used, as a liquid immediately vaporizes. It boils at 4.5°C (40.1°F) and freezes at -93°C (-135.4°F). When it is above boiling point temperature, it becomes a gas; if confined in a container under its own vapor pressure, it becomes a liquid. It is very slightly soluble in water. Methyl bromide is a toxic gas and precautions must be taken against exposure by use of a mask or respirator equipped with a canister or a cartridge approved for protection against organic vapors. Results of methyl bromide exposure are dizziness, blurring of vision, staggering of gait, slurring of speech, nausea and vomiting, and abdominal pain. Methyl bromide is used as a fire extinguishing agent and as a fumigant. The following precautions will be adhered to in use of methyl bromide:
- (1) Methyl bromide must be used only by experienced and properly instructed persons.
 - (2) Maintain good ventilation where methyl bromide is used.
 - (3) Gas mask or respirator equipped with canister or cartridges approved for organic vapors will be worn by personnel subjected to methyl bromide gas.
 - (4) Since intoxication resulting from exposure to methyl bromide does not always show up immediately, personnel thus exposed should be given immediate medical attention.
 - (5) The amount of methyl bromide in a cylinder is determined by weight.
- n. Methyl Chloride (CH_3Cl) (flammable) – methyl chloride is a colorless, noncorrosive, liquefiable gas which is transparent in both the gaseous and liquid state. It has a faintly sweet, ether-like odor. It is not irritating to the eyes or lungs, but has an anesthetic effect if breathed. Methyl chloride is heavier than air. It is flammable and presents a moderate explosive hazard in that it is explosive when mixed with certain proportions of air. It is principally used for refrigeration. Shipment is made in a liquid state. The use of methyl chloride is being supplanted by the use of Freon.
- (1) Methyl chloride is a flammable gas and should be handled with the same precautions used in handling hydrogen.
 - (2) The amount of gas in a cylinder is determined by weight.
- o. Nitrogen (N_2) (nonflammable) – nitrogen is a colorless, odorless, and tasteless gas which liquefies at -195°C (-320°F). It is an inert gas, slightly lighter than air and does not form flammable or explosive mixtures with air or oxygen, nor will it support combustion. It is nonpoisonous and is usually shipped in a gaseous state; however, it is also shipped as a liquid in vacuum bottle type containers. Nitrogen can dilute ambient oxygen to unsafe levels and create an asphyxiant atmosphere which could cause suffocation and death. Although ambient air is made up of approximately 80% nitrogen and 20% oxygen, precautions should be taken in confined spaces to ensure that oxygen has not been depleted. Never enter an area where nitrogen has been used as a purging gas until that area has been well-ventilated to disperse the nitrogen. Nitrogen is used for pressure operated mechanisms, as an expellent of other gases from their cylinders or for blowing out pipes, tubes, and lines. It is used to purge aircraft fuel tanks of harmful vapors before workers enter tanks for maintenance. The cylinder and valve are marked to identify contents. The authority for nitrogen is the latest issue of Federal Specification A-A-59503. The amount of gas in a cylinder is determined by pressure.
- (1) Nitrogen is divided into 2 subclasses, namely: Class 1, OIL FREE (formerly water pumped), and Class 2, OIL TOLERANT (formerly oil pumped). Oil tolerant nitrogen may be used where there is no potential danger in contaminating systems with oil. Most of the nitrogen gases are manufactured from liquid nitrogen as a dry, oil free gas.
 - (2) Nitrogen shall be considered oil free if the gas is compressed with a water lubricated compressor or if the gas is produced from a liquid which is oil free. Class 1 gaseous nitrogen shall be contained in oil free cylinders.
- p. Oxygen (O_2) (oxidizer) – oxygen is a colorless, odorless, and tasteless gas which liquefies at -297°F . It cannot remain in the liquid state at temperatures above -182°F . The gas is slightly heavier than air. Oxygen is nonflammable in itself; however, it supports rapid combustion of most materials. Contamination of oxygen with any combustible material is extremely hazardous. Oil, paints, greases, or similar materials must never be brought into contact with oxygen valves, regulators, etc. The Air Force uses a number of different grades of oxygen varying as to purity, dryness, and physical state. The current specification for aviator's breathing oxygen is MIL-PRF-27210. Oxygen covered by Federal Specification BB-O-925 is intended for use in industrial applications such as welding. In addition, commercial grade oxygen may be purchased for cutting and welding. The

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USP Grade of oxygen is used by hospitals as well as certain mixtures of oxygen with other gases. Gaseous oxygen is shipped in storage type cylinders. Liquid oxygen is shipped in special tanks, tank cars, and tank trucks.

- (1) Aviator's breathing oxygen may be purchased IAW Specification MIL-PRF-27210, from commercial oxygen manufacturers or may be produced by Air Force mobile oxygen generating plants. Liquid or gaseous oxygen may be received in either case, depending on the type of system in which it is to be used.
- (2) Cylinders returned from the using activity to the filling agency will not require drying if the cylinder has a positive pressure and does not contain an odor. Testing for pressure may be done by cracking the valve and noting whether or not any oxygen is emitted; testing for pressure and odor may be done by attaching a suitable regulator, adjusting the cylinder and regulator valves to obtain a gentle flow, reading the pressure gage, and smelling the escaping gas.
- (3) In order to prevent the accumulation of moisture within breathing oxygen cylinders while either being shipped or awaiting shipment to the filling agency, special precautions must be taken by the using activity to insure that the cylinder pressure is not reduced to atmospheric pressure. The pressure must be reduced to 5 – 38 psig in order to be shipped as empty in accordance with DOT regulations. Empty oxygen cylinders qualify for a much lower shipping rate. DOT considers an oxygen cylinder empty when it has a pressure of less than 40 psig. The ICC considers oxygen cylinders empty when they contain less than 50 psig. By contrast, when oxygen cylinders are shipped by air, IATA and the ATA only considers them empty when a vacuum is pulled on the cylinder. An oxygen cylinder shipped under pressure by air must be shipped in a special ATA Spec 300 shipping case with re-enforced corners and edges.
- (4) Under no conditions will breathing oxygen cylinders, reduced below 5 psi, be pressurized to this point by using activities prior to returning to filling agency.
- (5) Cylinders will not be pressurized at any point other than at the authorized filling agency except:
 - (a) When cascading oxygen from manifolded supply cylinders of tested and dry content,
 - (b) When liquid oxygen converters are used to convert liquid oxygen and transfer oxygen gas directly to storage cylinders,
 - (c) When pumping equipment is used.
 - (6) To avoid excessive waste of breathing oxygen, cylinders should be cascaded down to at least 150 psi. If the oxygen cannot be used down to 24 psi, it should be purged until slightly below 24 psi so that the lower shipping rates to the commercial filling agency can be used. The above precautions are not required when not transporting cylinders by common carrier to the filling agency.
 - (7) Aviator's breathing oxygen will not be used for welding oxygen, except in cases where welding oxygen is not available. In such cases, a suitable 24 psi check valve, available in USAF stock, will be used.
 - (8) The following precautions will be adhered to in the use of oxygen cylinders:
 - (a) Oxygen must not be stored or used near combustible material or any substance likely to start or accelerate fire. Oxygen is not flammable but supports combustion intensively. Store at least 50 feet from combustible materials.
 - (b) Oxygen cylinders must not be stored with hydrogen or other combustible gas cylinders in an unventilated place. If stored inside, they should be separated by a fire resistant wall.
 - (c) Do not store oxygen cylinders and apparatus under moving machinery, cranes, or belts. Oil and grease may drop and cause explosion and fire.
 - (d) Exercise care that compressed oxygen does not become contaminated in any way with hydrogen, hydrocarbon gases, or oil base liquids as a serious explosion will result.
 - (e) Oil or grease must never be allowed to come into contact with or be used in the presence of oxygen cylinders, valves, regulators, gages, or fittings.
 - (f) Never lubricate oxygen valves, regulators, gages, or fittings with oil or any substance.
 - (g) Hands should be clean and free from oil before using oxygen equipment; do not wear greasy gloves or clothing.
 - (h) Never permit oxygen cylinders to come into contact with electrical welding circuits or apparatus.

- (i) Do not allow sparks or flames from welding or cutting torch or any other source to contact cylinders. A spark is not necessary to explode oxygen. The chemical reaction of having fuel gases and oils combined with oxygen is sufficient to develop spontaneous combustion, causing an explosion.
 - (j) Never use oxygen from a cylinder without reducing the pressure through a regulator.
 - (k) Never attempt to mix other gases or compressed air in an oxygen cylinder.
 - (l) Never test for pipe line leaks or blow out pipe lines with oxygen unless lines are specifically made and cleaned for oxygen use. Use water pumped dry nitrogen, which does not aid combustion, for this purpose. Pipes, pipe threads, and other pressure containers are sometimes greased or oiled. Using compressed oxygen for the general purpose of testing for leaks is extremely dangerous and almost certain to cause a violent explosion.
 - (m) Do not confuse air with oxygen. Oxygen is one of several elements contained in air and should always be described by its proper name. Any attempt to use oxygen in place of compressed air is apt to result in an accident. NEVER use oxygen for pneumatic tools, for starting diesel engines, as a pressure agent in oil reservoirs, for paint spraying, or for any use other than breathing, welding, or cutting.
 - (n) Do not use nitrogen transfer pump for transferring oxygen.
 - (o) Before any attempt is made to connect oxygen cylinder to oxygen systems BE SURE THAT EACH CYLINDER IS PROPERLY AND CORRECTLY IDENTIFIED AS CONTAINING OXYGEN.
 - (p) The amount of oxygen in a cylinder is determined by pressure.
- q. Sulphur Dioxide (SO₂) (nonflammable) – sulphur dioxide is a colorless gas with a peculiar, disagreeable, irritating, and suffocating odor. It is easily liquefied and 2.2 times as heavy as air. It is nonflammable and does not support combustion. It is shipped in a liquid state and is used for refrigeration purposes. The following precautions will be adhered to in use and handling of sulphur dioxide.
- (1) Only personnel familiar with the use of this gas will engage in work with it.
 - (2) Where sulphur dioxide is used, gas masks equipped with canisters approved for protection against acid gases will be used.
 - (3) Leaks may be detected by passing a rag dampened with ammonia over the suspected area of leakage. White fumes, resulting from mixture of ammonia and sulphur dioxide, will indicate the point from which the gas is escaping.
 - (4) The amount of gas in a cylinder is determined by weight.

Table 3-1. Characteristics of Compressed Gases

Gas	Color	Odor	Compared to Air	Flammable	Effects	Physical State	Remarks
Acetylene	None	Garlic-like	Lighter	YES	Anesthetic	Dissolved	
Air, Compressed	None	None	Same	NO	None	Gas	
Ammonia	None	Pungent	Lighter	NO	Irritant	Liquid	Corrosive
Argon	None	None	Heavier	NO	None	Gas	Inert
Carbon Dioxide	None	Faint	Heavier	NO	None	Liquid	
Carbon Monoxide	None	Faint	Lighter	YES	Asphyxiant	Gas	Toxic
Chlorine	Greenish-Yellow	Disagreeable	Heavier	NO	Irritant	Liquid	Toxic
Dichlorodifluoromethane (Freon-12)	None	None	Heavier	NO	Asphyxiant	Liquid	
Helium	None	None	Lighter	NO	None	Gas	Inert
Hydrogen	None	None	Lighter	YES	None	Gas	
Liquid Petroleum Gases (propane, butane)	None	Artificial	Heavier	YES	Intoxicant	Liquid	
Methylacetylene-Propadiene	None	Strong	Heavier	YES	Anesthetic	Liquid	
Methyl Bromide	None	Pungent	Heavier	NO	Irritant	Liquid	Toxic
Methyl Chloride	None	Ether-like	Heavier	YES	Anesthetic	Liquid	Toxic
Nitrogen	None	None	Lighter	NO	None	Gas	Inert
Oxygen	None	None	Heavier	NO	None	Gas	Oxidizer
Sulfur Dioxide	None	Disagreeable	Heavier	NO	Irritant	Liquid	Corrosive

CHAPTER 4

DESCRIPTION OF COMPRESSED GAS CYLINDERS, MARKINGS, AND ACCESSORIES

4.1 PURPOSE.

The purpose of this chapter is to describe compressed gas cylinders, accessories, and the markings which are required by DOT Specifications.

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4.2 CYLINDER TYPES.

Compressed gas cylinders, used for shipping and storage of high- and low-pressure gases, are of various types and sizes. The construction characteristics are governed by the type of gas and service in which the cylinder will be used. The cylinders used throughout the Air Force are managed by DGSC, Richmond, Virginia. These cylinders are identified by DOT, CTC, or ICC Specifications 3, 3A, 3AA, 3AL, 4, 4A, 4AA, 4B, 4BA, 4BW, 8, and 8AL. Although some of these cylinders are substantially the same in appearance, they are not interchangeable.

In no event are any of the above markings to be changed or obliterated. The inspector's mark is placed near the serial number by the individual who inspected the cylinder at the point of manufacture. The date of original test is so placed that subsequent test dates may be added without obliterating the original and succeeding test dates.

- a. High-pressure gases, such as oxygen, nitrogen, and hydrogen, are contained in cylinders of seamless construction DOT 3A, 3AA, or 3AL.
 - b. Low-pressure gases, such as propane, butane, or refrigerant gas are contained in cylinders which are welded or brazed. These cylinders are made IAW DOT, ICC, 4B, 4BA, 4BW.
 - c. Acetylene cylinders are fabricated IAW Specification DOT 8, 8AL, or 8W. These are low-pressure cylinders limited in service pressure to 250 psi and equipped with safety devices that will melt at 212°F to relieve internal pressure in case of excessive heat or fire. They are different from all others in that they contain a porous filler which is impregnated with a definite amount of acetone. Acetylene cylinders have either recessed or slightly rounded tops.
- a. Markings identifying government ownership are as follows: U.S. Government, U.S. Property, WD, AF, DA, USA, USN, N, U.S., or the name of a DoD or other government agency impressed into the shoulder of the cylinder or embossed on the marking. A Military or Federal Specification number impressed into the shoulder of the cylinder will also establish government ownership.
 - b. Tare Weight – the tare weight of a compressed gas cylinder includes the empty cylinder with its valve, but does not include the valve protection cap. For acetylene cylinders, the tare weight includes the acetone and filler material. Cylinders in liquified gas service or in acetylene service require tare weight to be permanently marked on the cylinder, cylinder flange, or collar. Tare weight is generally marked in pounds and tenths of pounds, following the letters TW for liquified gas applications. Tare weight is used to determine the quantity of gas commodity required to charge a cylinder by weight. Tare weight markings on acetylene cylinders are generally indicated by a whole number of pounds and a whole number in 4-oz increments.
 - c. Other markings for cylinders is the nonshatterability characteristics. Nonshatterability is the property of the metal in a cylinder to remain in 1 piece rather than to fragment when a cylinder bursts from excessive pressure or when pierced by a high velocity projectile. Nonshatterable cylinders will be identified by one of the following markings stamped into the metal of the cylinder: NONSHATTERABLE, NONSHAT, SHATTER-PROOF; DOT (ICC) 3AA cylinders, 8 inches or larger in diameter, are accepted as nonshatterable.

4.3 CYLINDER MARKINGS.

DOT Specifications for cylinders require that all cylinders have standard markings. DOT requires that these markings are stamped on the shoulder of the cylinder near the neck in the following sequence, beginning at the top: DOT, ICC Specification Number, followed by service pressure, the serial number of the cylinder, and an identifying symbol VIZ:

4.4 CYLINDER ACCESSORIES.

a. Valves – the valves installed in compressed gas cylinders control the flow of compressed gas to and from the cylinders. Valve bodies and some of their component parts are forged of brass, bronze, or steel, and are made in a wide variety of shapes and sizes for identification purposes. Valves required for use with a specific gas will be marked with the name of the gas on at least 1 side of the valve body. Military Specification MIL-DTL-2 sets forth the requirements for valves and valve outlet connection caps/plugs for compressed gas cylinders. Maintenance or replacement of valves and safety-relief devices will be accomplished IAW MIL-STD-1411. Valves installed on cylinders will be considered acceptable for further use provided:

1. They are serviceable and functionally equal to new valves in operation and cleanliness.
2. They are equipped with a properly rated safety device in serviceable condition.
3. Valves are free of insects, insect webs, dirt, paint, corrosion, oil, or grease.

b. Valve Protection Caps – most compressed gas cylinders have threaded valve protection caps which screw on the neck or the neckring of the cylinders to protect the valve. Cylinders that are so constructed with recessed control valves do not require a valve protection cap. Not all cylinders (medical) are equipped with a threaded neck to support a valve protection cap. The following requirements will be adhered to on valve protection caps:

1. Neck or neckring threads on cylinders shall be in serviceable condition, capable of securely holding the valve protection cap with the cap installed to full threaded engagement.
2. Protection caps shall be installed on all cylinders designed with neckrings or flanges.
3. Protection caps shall be of correct size and installed hand-tight with full thread engagement.

4. Caps shall be painted to comply with color code of the cylinder on which they are installed. Painting will be accomplished IAW MIL-STD-101.

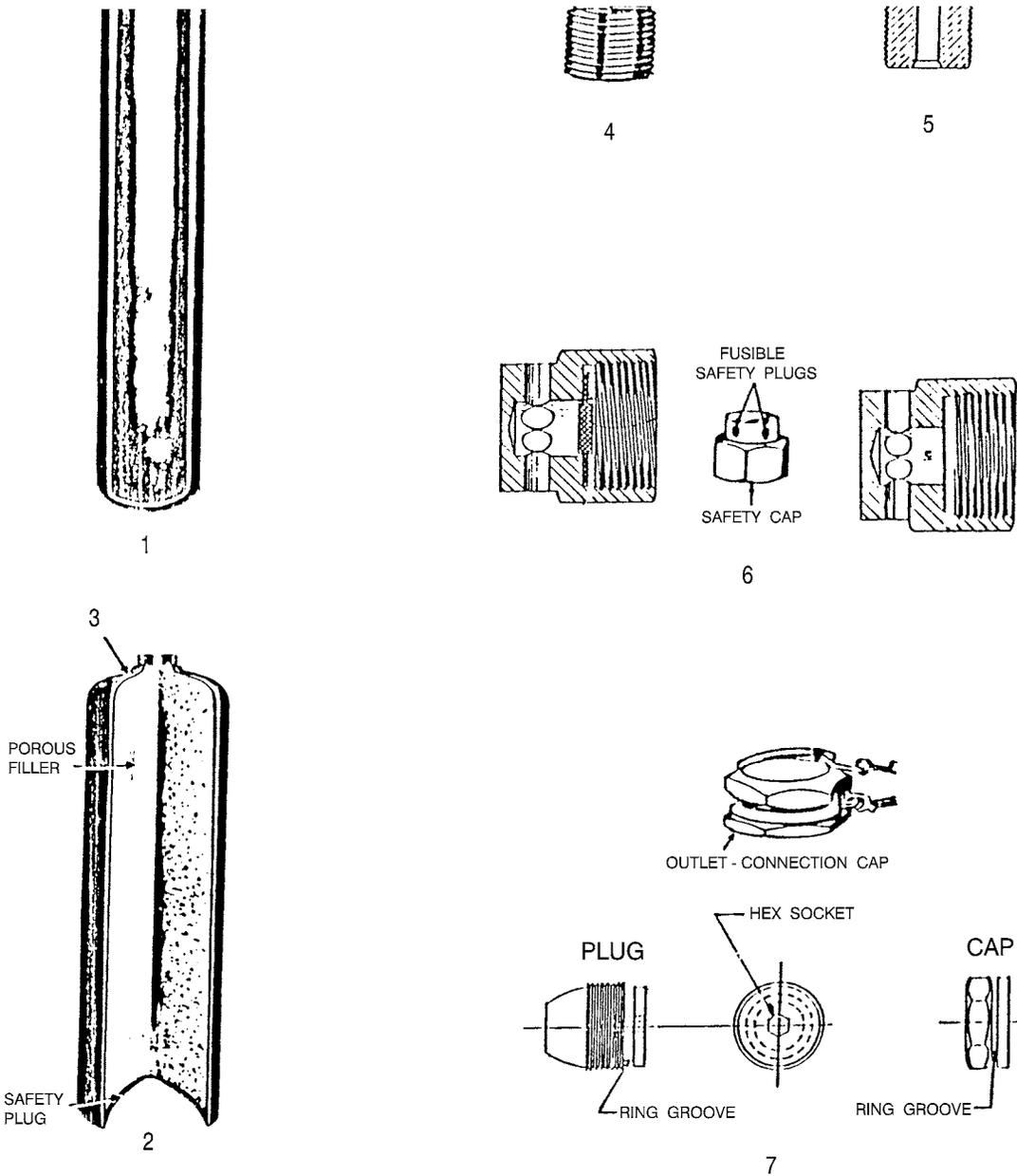
c. Safety-Relief Devices – most cylinder valves are equipped for a safety-relief device. This device is intended to prevent rupture of a cylinder under certain conditions of exposures. The most common type is the FRANGIBLE DISC, Fusible Plug, or combination Frangible Disc/Fusible Plug.

Frangible Disc is an operating part in the form of a disc, usually of metal and which is so held as to close the safety-relief device channel under normal conditions. The disc is intended to burst at a predetermined pressure to permit the escape of gas. Such discs are generally of flat, preformed, reinforced, or grooved types.

Fusible Plug is an operating part in the form of a plug of suitable low melting material, usually a metal alloy, which closes the safety-relief device channel under normal conditions and is intended to yield or melt at a predetermined temperature to permit the escape of gas.

Combination Frangible Disc Fusible Plug is a frangible disc in combination with a low melting point fusible metal, intended to prevent its bursting at its predetermined bursting pressure unless the temperature also is high enough to cause yielding or melting of the fusible metal.

d. Valve Outlet Connection Cap and Plugs – metal valve outlet connection caps/plugs as specified in MIL-DTL-2, designed to form a secondary seal. They are designed to prevent contamination of certain gases. The valve outlet cap or plug is attached and secured to the cylinder with a chain and retaining rings.



LEGEND

- 1. Oxygen Cylinder
- 2. Acetylene Cylinder
- 3. Valve Protection Cap
- 4. Oxygen Valve
- 5. Cylinder Valve with Safety Device
- 6. Safety Devices
- 7. Valve Outlet Connections

Figure 4-1. Cylinder and Cylinder Accessories

CHAPTER 5

EXTERNAL INSPECTION OF COMPRESSED GAS CYLINDERS

5.1 PURPOSE.

The purpose of this chapter is to give instructions in the external inspection of low- and high-pressure compressed gas cylinders.

5.2 REQUIREMENTS.

- a. Cylinder inspection will be performed by qualified personnel familiar with the handling and use of compressed gas cylinders and having knowledge of the necessary precautions to be observed.
- b. Cylinders shall be visually inspected when received by base supply from commercial contractor.
- c. Cylinders in use or hooked up to equipment for an extended period of time (1 year) shall comply with external inspection procedures of this chapter, annually. Date of inspection shall be annotated on cylinder tag DD Form 1574.

NOTE

A cylinder fully or partly charged, with or without a valve cover, not physically connected to a system or equipment, merely sitting outside, in a warehouse, or storage area is considered in storage.

5.3 DEFINITIONS.

The following definitions apply to terms used in the external visual inspection of cylinders.

- a. High- and Low-Pressure Cylinders – high-pressure cylinders are those with a marked service pressure of 900 psi or greater; low-pressure cylinders are those with a marked service pressure less than 900 psi.
- b. Minimum Allowable Wall Thickness – the minimum allowable wall thickness is the minimum wall thickness required by the specification under which the cylinder was manufactured.
- c. Dents – dents in cylinders are deformations caused by its coming in contact with a blunt object in such a way that the thickness of metal is not materially impaired. A typical dent is shown in Figure 5-1.

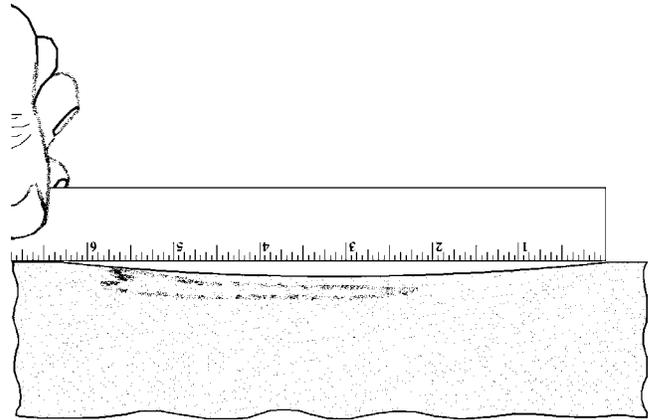


Figure 5-1. Measuring the Length of a Typical Dent

- d. Cuts, Gouges, or Digs – cuts, gouges, or digs in cylinder are deformations caused by contact with a sharp object in such a way as to cut into or upset the metal of the cylinder, decreasing the wall thickness at that point.
- e. Corrosion or Pitting – corrosion or pitting in cylinders involves the loss of wall thickness by corrosive media. There are several kinds of pitting or corrosion to be considered.
- f. Isolated Pitting – isolated pits of small diameter do not effectively weaken the cylinder. Figure 5-2 shows a typical example of isolated pitting.
- g. Line Corrosion – when pits are connected to others in a narrow band or line, such a pattern is termed **LINE CORROSION**. This condition is more serious than isolated pitting. An example of line corrosion is shown in Figure 5-3.
- h. Crevice Corrosion – corrosion which occurs in the area of the intersection of the footing or heading with the cylinders. Figure 5-4 is an example of crevice corrosion.
- i. General Corrosion – general corrosion is that which covers considerable surface areas of the cylinder. It reduces the structural strength. It is often difficult to measure or estimate the depth of general corrosion because direct comparison with the original wall cannot always be made. General corrosion is often accompanied by pitting. This form of corrosion is shown in Figure 5-5 and Figure 5-6.

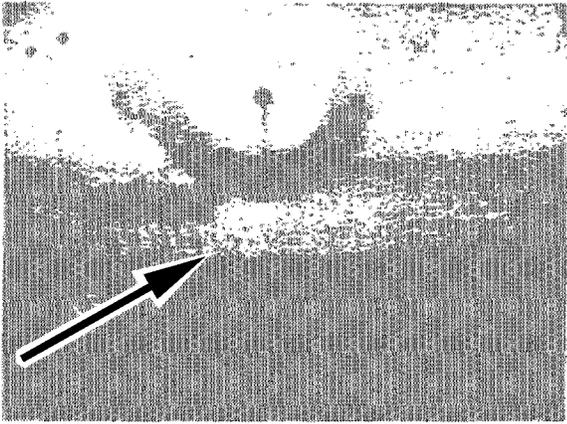


Figure 5-2. Isolated Pitting

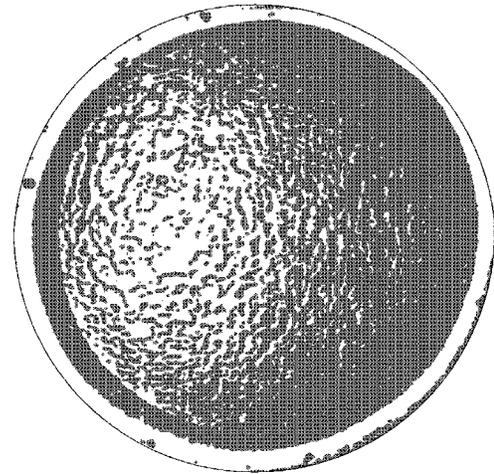


Figure 5-5. General Corrosion with Pitting

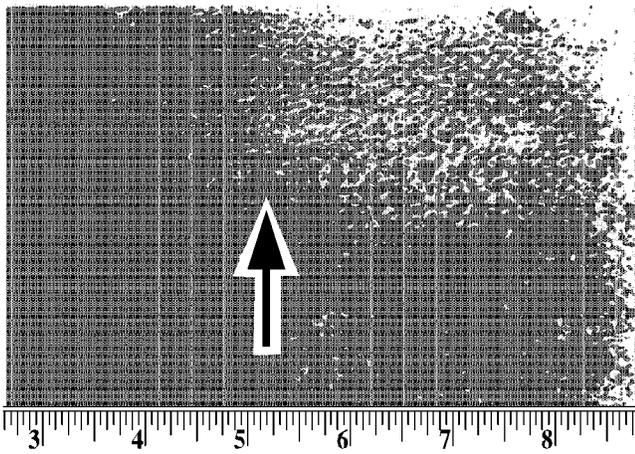


Figure 5-3. Line Corrosion

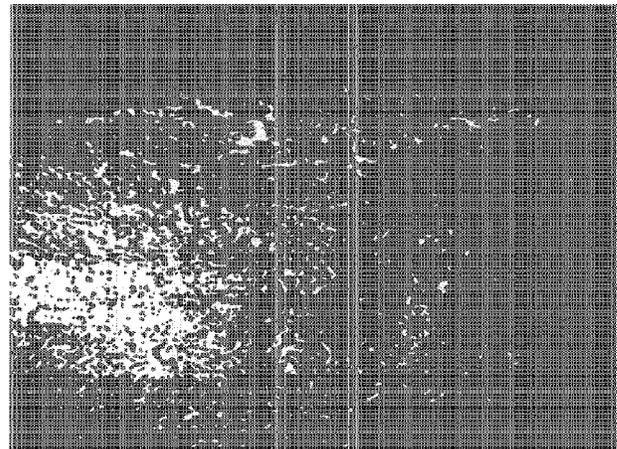


Figure 5-6. General Corrosion with Pitting on Cylinder Wall

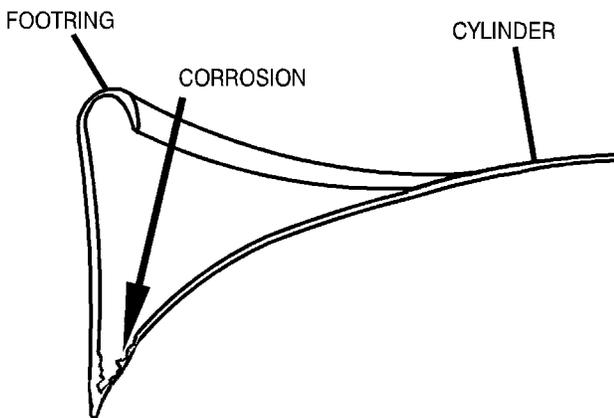


Figure 5-4. Crevice Corrosion near the Cylinder Footring

- j. Weld Defects – cracks or flaws in weld areas reduce the structural strength of metal which may cause separation when pressurized.
- k. Fire Damage – cylinders which show evidence of exposure to fire. Common evidence of exposure to fire is:
 1. Charring or Burning of the Paint or Other Protective Coat
 2. Burning or Scarfing of the Metal
 3. Distortion of the Cylinder
 4. Melted Out Fuse Plugs

5. Burning or Melting of the Valve

- l. Arc and Torch Burns – cylinders which show evidence of arc and torch burns may be recognized by one of the following conditions:
 1. Removal of Metal by Scarfing or Cratering
 2. A Scarfing or Burning of the Base Metal
 3. A Deposit of Weld Metal or Displacement of Base Metal
- m. Bulges – cylinders are manufactured with a reasonably symmetrical shape. Bulges are visible variations from normal cylinder contour which can be measured. See Figure 5-7 for an example of a bulged cylinder.
- n. Neck Defects – cylinder necks shall be examined for cracks, folds, and other flaws. Neck defects are normally detected by testing the neck during charging operations with a soap solution.
- o. Attachments – attachments on cylinders consist of footrings and headrings. The attachments cause the cylinder to remain stable and upright and to protect the valve. These attachments and the associated portion of the cylinder must receive careful inspection. Rings shall be examined for distortion, looseness, and for failure of welds. The entire region of attachments to the cylinder must be checked for possible entry of moisture to the areas of the cylinder surface which cannot be seen. See Figure 5-8 for types of footing weld arrangements. Some cylinders have removable attachments, such attachments must be removed for visual inspection.
- p. Tare Weight – tare weight is the weight of an empty cylinder plus the cylinder valve, but not the valve protection cap. No working pressure is indicated on this type of cylinder.
- q. Rejected Cylinder – a cylinder not fit for service in its present condition. May be requalified by either additional testing to verify adequacy of cylinder for continued service, or by reheat treatment, repair, or rebuilding to correct the defect. Rejected cylinders shall be tagged with DD Form 1577-2 (Green Tag) and returned to an authorized contractor for requalification.
- r. Condemned Cylinders – a cylinder no longer fit for service. Cylinders with defects equal to or greater than the limits set in this chapter shall be condemned. A DD Form 1577, Unserviceable (Condemned Tag) shall be attached to the cylinder and the cylinder will be returned to an authorized contractor for disposition.

5.4 INSPECTION EQUIPMENT.

Depth gauges, scales, etc. Exterior corrosion, denting, bulging, gouges, or digs are normally measured by simple direct measurement with scales or depth gages. In brief, a rigid straightedge of sufficient length is placed over the defect and a scale is used to measure the distance from the bottom of the straightedge to the bottom of the defect. There are also available commercial depth gages which are especially suitable for measuring the depth of small cuts or pits. It is important when measuring such defects to use a scale which spans the entire affected area. When measuring cuts, the upset metal should be removed or compensated for so that only actual depth of metal removed from the cylinder wall is measured.

5.5 INSTRUCTIONS FOR INSPECTION OF LOW-PRESSURE CYLINDERS.

- a. General Exterior Inspection – cylinders shall be checked as outlined below for corrosion, general distortion, or any other defect that might indicate a weakness which would render it unfit for service.
- b. Preparation for Inspection – rust, scale, caked paint, etc. shall be removed from the exterior surface so that the surface can be adequately observed. Equipment should be provided to facilitate inspection of the bottom of the cylinder. This is important because experience has shown this area to be the most susceptible to corrosion.
- c. Corrosion Limits – to fix corrosion limits for all types, designs, and sizes of cylinders and include them in this technical order is not practicable. Failure to meet any of the following general rules is cause for condemning a cylinder:
 - (1) A cylinder shall be condemned when the tare weight is less than 90% of the original stamped tare weight.
 - (2) A cylinder shall be rejected when the tare weight is less than 95% of the original tare weight marked on the cylinder. When determining tare weight, be sure that the cylinder is empty. A rejected cylinder shall be returned to an authorized contractor for requalification.
 - (3) A cylinder shall be condemned when the remaining wall in an area having isolated pitting only is less than 1/3 of the minimum allowable wall thickness.
 - (4) A cylinder shall be condemned when line or crevice corrosion on the cylinder is 3 inches in length or over and the remaining wall is less than $\frac{3}{4}$ of the minimum allowable wall thickness or when line or crevice corrosion is less than 3 inches in length and the remaining wall

thickness is less than $\frac{1}{2}$ the minimum allowable wall thickness.

- (5) A cylinder shall be condemned when the remaining wall in an area of general corrosion is less than $\frac{1}{2}$ of the minimum allowable wall thickness.
- (6) The thickness on the bottom of the cylinder is approximately 1 inch, if corrosion or pitting, cuts, gouges exceed $\frac{1}{4}$ inch (0.250) the cylinder shall be condemned. However, stamping or markings at the bottom of cylinders which exceeds $\frac{1}{4}$ inch (0.250) is acceptable.

d. Specific Corrosion Limits.

- (1) General Corrosion Accompanied by Pitting – the cylinder shall be condemned:
 - (a) When the actual wall thickness can be measured and the remaining wall is less than 0.063 inch.
 - (b) When the wall thickness cannot be measured and the original wall thickness is unknown, when the deepest pit in general corrosion area exceeds 0.042 inch.
 - (c) When the actual wall thickness cannot be measured but the original wall thickness is known, when the original wall, less $1\frac{1}{2}$ times the maximum pit depth, is less than 0.063 inch.
- (2) Isolated Pits Not in General Corrosion Area – the cylinder shall be condemned:
 - (a) When the actual wall thickness can be measured and its remaining wall is less than 0.042 inch.
 - (b) When the actual wall thickness cannot be measured and the original wall thickness is unknown, and the pit depth on the wall exceeds 0.084 inch.
 - (c) When the actual wall thickness cannot be measured and the original wall thickness is known, and the remaining wall obtained by subtracting the maximum pit depth from the original wall is less than 0.042 inch.

e. Dents – dents are of concern where the metal deformation is sharp and confined, or where it is near a weld. Where metal deformation is not sharp; dents of larger magnitude can be tolerated. Cylinder shall be condemned if the following condition exists:

- (1) Dent at Welds – where denting occurs so that any part of the deformation includes a weld, the

maximum allowable dent depth shall be $\frac{1}{4}$ (0.250) inch.

- (2) When denting occurs so that no part of the deformation includes a weld, the cylinder shall be rejected if the depth of the dent is greater than $\frac{1}{10}$ of the greatest dimension of the dent.

f. Cuts, Gouges, or Digs – cuts, gouges, or digs reduce the wall thickness of the cylinder and in addition contributes to increased stress. The cylinder shall be condemned:

- (1) Whenever the length of the defect is 3 inches or greater, and $\frac{1}{32}$ (0.031) inch in depth.
- (2) When the original wall thickness cannot be measured, and if the cut, gouge, or dig exceeds $\frac{1}{2}$ of the original minimum allowable wall thickness.
- (3) When the original wall thickness at manufacture is known, or the actual wall thickness is measured and if the original wall thickness minus the depth of the defect is less than $\frac{1}{2}$ of the original minimum allowable wall thickness.
- (4) Leaks can originate from a number of sources, such as defects in a welded or brazed seam, defect at the threaded opening, or from sharp dents, digs, gouges, or pits. If leaks are suspected, reference Chapter 7 of this technical order.

5.6 SPECIFIC INSPECTION INSTRUCTIONS.

a. Cylinders shall be rejected when the following conditions exist. Rejected cylinders shall be returned to an authorized contractor for requalification.

- (1) When the footing and heading of cylinders no longer perform their intended function. Reference Paragraph 5.3, Step o of this chapter.
- (2) When excessive corrosion is found in the footing or neckring (collars).

b. Cylinders shall be condemned when the following conditions exist:

- (1) Evidence of overheating such as fire, burns, warping, or distortion.
- (2) Cylinders which have visible bulges.
- (3) When line or crevice corrosion on the cylinder is three inches or greater, and $\frac{1}{32}$ (0.031) inch in depth.
- (4) Cylinder necks with cracks, folds, flaws, and distortion.

5.7 INSTRUCTIONS FOR INSPECTIONS ON HIGH-PRESSURE CYLINDERS.

- a. General Exterior Inspection – cylinders shall be checked as outlined below for corrosion, general distortion, or any other defect that might indicate a weakness which would render it unfit for service.
- b. Preparation for Inspection – cylinder sidewalls and bottoms shall be in a condition that allows adequate visual inspection. If paint or other material has accumulated on the cylinder thick enough to prohibit full view of possible sidewall and bottom defects, such accumulation shall be removed.
- c. Corrosion Limits – to fix corrosion limits for all cylinder types, designs, and sizes, and include them in this technical order is not practicable. The following general rules should be applied when inspecting cylinders:
 - (1) A cylinder shall be rejected when the remaining wall thickness in an area having crevice corrosion, line corrosion, or general corrosion is less than the minimum allowable wall thickness obtained using the maximum wall stress limitation.
 - (2) A cylinder shall be rejected when the remaining wall thickness in an area having isolated pitting is less than 2/3 of the average wall thickness at manufacture.
- d. Specific Corrosion Limits.
 - (1) Crevice Corrosion, Line Corrosion, or General Corrosion – when the original wall thickness of the cylinder is unknown, and the actual wall thickness is not measured, the cylinder shall be rejected if corrosion exceeds 1/32 inch (0.031 inch) in depth.
 - (2) Isolated Pits – when the original or actual wall thickness of the cylinder is not known, and the actual wall thickness is not measured, the cylinder shall be rejected if the pit depth exceeds 0.084 inch. When the wall thickness is known, or the actual wall thickness is measured, this thickness, less the pit depth, shall not be less than 0.168 inch.
- e. Hammer Test.
 - (1) The hammer test is a valuable indicator of internal corrosion and is a convenient test that can be made without removing the valve prior to each charging of the cylinder. The hammer test should be performed on empty unpressurized cylinders.

- (2) The hammer test consists of tapping the cylinder sidewall with a light blow using a ½ lb ball-peen hammer or equivalent. A cylinder will normally have a clear ring. A dull ring would indicate internal corrosion, liquid, or accumulation of foreign material in the cylinder.

5.8 SPECIFIC INSPECTION INSTRUCTIONS.

- a. Dents – dents can be tolerated when the cylinder wall is not deformed excessively or abruptly. Considerations of appearance play a major factor in the evaluation of dents. In general, industry practice for a 9 inches diameter x 51 inches long cylinder accepts dents up to 1/16 inch (0.062 inch) depth when the major diameter of the dent is 2 inches or greater.
- b. Cuts, Digs, or Gouges – cuts, digs, or gouges may be measured with suitable depth gauges. Any upset metal shall be smoothed off to allow true measurement without causing further damage to parent metal.
 - (1) The limits for cuts, digs, or gouges are determined by cylinder maximum wall stress limitations.
 - (2) If suspect, cylinder shall be rejected and returned to authorized contractor for requalification.
- c. Arc and Torch Burns – cylinders with arc or torch burns shall be rejected. Defects of this nature may be recognized by one of the following conditions:
 1. Removal of Metal by Scarfing or Cratering
 2. A Scarfing or Burning of the Base Metal
 3. A Hardened Heat Affected Zone
 4. A Deposit of Weld Metal or Displacement of Base Metal
- d. Cylinders shall be rejected when there is evidence of overheating such as fire, arc, torch burns, warping, or distortion.
- e. Bulges – cylinders with definite visible bulges such as bulges caused by fire damage shall be condemned.
- f. Cylinder neck and attachments shall be inspected for cracks, folds, and other flaws. Removable attachments must be removed for visual inspection.

5.9 INTERNAL INSPECTION.

Cylinders shall be inspected internally at least every time the cylinder is periodically retested (Hydrostatic Testing).

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Internal inspection shall be accomplished by an authorized contractor.

5.10 CYLINDER MAINTENANCE.

If extensive cylinder maintenance is required, general requirements and detailed procedures are listed in MIL-STD-1411.

5.11 OBSOLETE, UNSERVICEABLE, AND UNAUTHORIZED CYLINDERS.

The following cylinders are no longer serviceable, regardless of their physical appearance and shall be removed from further service:

- a. Condemn all high-pressure gas cylinders regardless of appearance manufactured by Taylor Division, Cuneo Press. These cylinders may be identified by the symbol cTd, stamped under or near the serial number or hydrostatic test date. These cylinders can be further identified by the ICC stamp 3A1800 on neck, and cylinder size approximately 9 inches diameter x 51 inches high (Reference AFMAN 23-227 (AFJMAN 23-227)).
- b. Condemn all cylinders that were manufactured by the Taylor Wharton Iron and Steel Co. during the period 1942 – 1944, with a service pressure that has been increased from 1800 to 2015 psig. These cylinders have the symbol TW stamped on the shoulder. (The earliest hydrostatic test date is the date of manufacture.) These cylinders can be further identified by size, approximately 9 inches diameter x 51 inches high and following serial numbers which are inclusive: N33557 – N33756; N87461 – N87660; N40097 – N40296; and N51397 – N51596. The above serial numbers are the only ones affected in this group (Reference AFMAN 23-227 (AFJMAN 23-227)).
- c. Condemn all cylinders not manufactured, inspected, and tested in accordance with the applicable DOT specifications as specified in Title 49, CFR, Part 178, Subpart C, and re-qualified in accordance with Title 49, CFR, Section 173.34 (see Paragraph 3-2). A cylinder that has been manufactured by an approved source will contain at minimum the permanent markings required by Title 49, CFR. These markings shall include a DOT specification number followed by the service pressure, a serial number followed by an identifying symbol of

the maker or purchaser, and an approved inspector's official mark and the date of test. An exception to this rule will be cylinders that have been manufactured to a Military Specification for a specific military application. In such cases the appropriate Military Specification will be stamped on the cylinder in lieu of the DOT specification. The re-qualification criteria shall be based on the cylinder design and its application as cited in the design specification.

5.12 CARBON DIOXIDE CYLINDER INSPECTION.

Inspect all CO₂ cylinder valves concerning safety-relief devices with combination frangible disk and fusible plug, 165°F or 212°F. This type of safety device is incorrect for use with CO₂ gas cylinders and must be removed from the valves. The correct safety-relief device to be used is the frangible disk only. All CO₂ cylinders and CO₂ valves must be checked for this error and placed in condition Code L, until the correct safety device is installed.

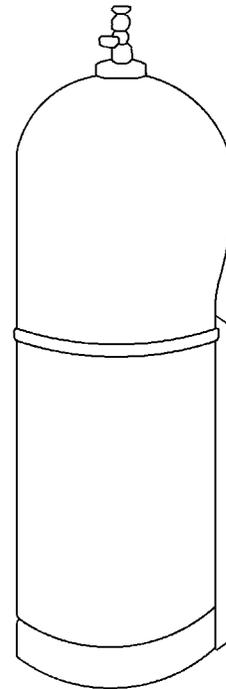


Figure 5-7. Bulged Cylinder

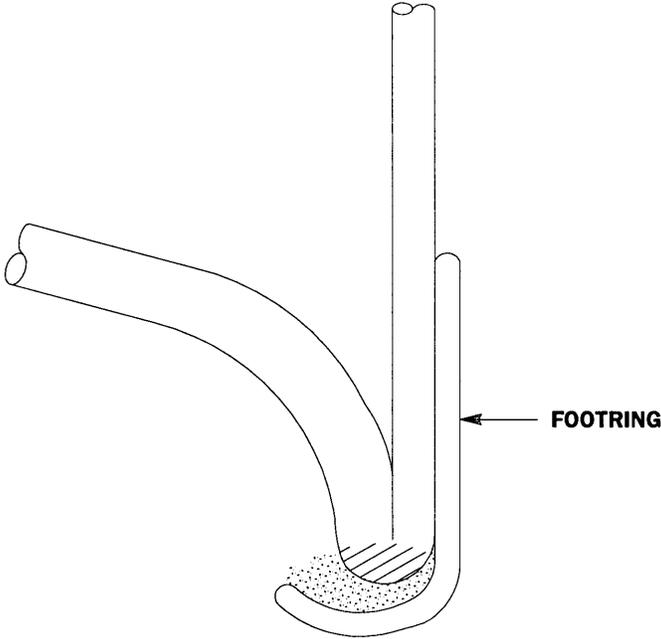


Figure 5-8. Bottom Head-to-Sidewall Weld Arrangement

CHAPTER 6

HYDROSTATIC TEST REQUIREMENTS

6.1 PURPOSE.

The information contained in this chapter will provide a working knowledge of the hydrostatic test requirements for compressed gas cylinders at the organizational and intermediate level.

6.2 HYDROSTATIC TESTING.

- a. Required testing of cylinders is normally accomplished at contractor facilities that have been approved and registered with the DOT. Military organizations that perform hydrostatic testing will also be approved and registered with the DOT. All compressed gas cylinders used for storing and transporting purposes will be periodically hydrostatic tested.
- b. Prior to shipment for refill, insure that EMPTY cylinders are not due for hydrostatic test. If the hydrostatic testing date is within 45 days of being due, request the contractor to perform the hydrostatic testing before filling.
- c. Activities using this technical order shall insure that all government owned cylinders are scheduled for hydrostatic testing IAW Table 6-1. When cylinder reaches hydrostatic retesting date and after cylinder contents have been exhausted, a (blue) DD Form 1576/Modification Tag will be attached. Supply condition Code D shall be annotated in the appropriate block identifying that the cylinder has exceeded the hydrostatic test date. All other tags will be removed except the required DOT label.

6.3 INSPECTION FOR HYDROSTATIC TEST.

- a. Cylinders will be inspected prior to issue or shipment to determine last hydrostatic test date. Cylinders shall not be shipped to overseas activity when the hydrostatic test will become due within 6 months after date of shipment. Cylinders with their hydrostatic retest overdue or due within 6 months will be limited to shipment and issue within the continental limits of the United States.



Any cylinder which has exceeded the periodic hydrostatic test date shall not be refilled until the required hydrostatic test is performed.

- b. Compressed gas cylinders installed in service or in storage that are fully or partly charged will be considered serviceable regardless of the hydrostatic test due date provided the cylinder complies with all of the following:
 - (1) The cylinder meets the inspection requirement of Chapter 5 of this technical order.
 - (2) The cylinder meets the leak test requirement of Chapter 7 of this technical order.
 - (3) Any cylinder exceeding the hydrostatic test date and/or does not comply with the 2 preceding Steps (1) and (2) will be turned in for retest and/or inspection.

- (1) The cylinder meets the inspection requirement of Chapter 5 of this technical order.
 - (2) The cylinder meets the leak test requirement of Chapter 7 of this technical order.
 - (3) Any cylinder exceeding the hydrostatic test date and/or does not comply with the 2 preceding Steps (1) and (2) will be turned in for retest and/or inspection.
- c. A cylinder in service is considered to be physically connected or hooked up to a system. A cylinder fully or partly charged, with or without a valve cover, not physically connected to a system regardless of physical location, is considered in storage. All cylinder inventories should be regulated so that the oldest cylinders are used first. This will also serve to reduce the number of leak tests required per Paragraph 7.3 of this technical order.

6.4 HYDROSTATIC TEST DATES.

- a. Compressed gas cylinders will not be refilled if the prescribed service period between hydrostatic tests has expired. Each time a cylinder is retested, the date of test is stamped on the shoulder of the cylinder with a steel stamp to indicate the month and year of the test. This date is used to determine the next scheduled retest date.
- b. The service period for each type of cylinder is considered to have expired if the latest marked test date stamped on the shoulder of the cylinder precedes the current date by more than the period indicated below.

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- c. All cylinders not exceeding 2 inches outside diameter and a length of less than 2 feet are exempted from hydrostatic retest. Cylinders that are designated 3E, 4C, 8, or 8AL are exempted from hydrostatic retest.
- d. The requirement for a cylinder to be retested after the expiration of a specific service period is further clarified to indicate that after the expiration of the service period, the cylinder shall not be refilled until the retest is performed. This is to imply that a full cylinder is considered serviceable until the product is exhausted, and then it cannot be refilled until a hydrostatic retest is performed.
- e. The number of exemptions for hydrostatic testing requirements has grown to the point where it can no longer be presented in this Technical Order. The re-qualification period depends upon many factors to include, but not limited to, the cylinder's date of manufacture, the gas being stored in the cylinder, the application of the cylinder, and the coating used on the cylinder. For this reason, Table 6-1 has been revised to reflect the re-qualification period in years and the applicable subsections of 49 CFR to review. Refer to Paragraph 6.6 for additional cylinder exemptions not covered in Table 6-1.
- f. The Code of Federal Regulations (CFR) cited in Table 6-1 can be accessed on the internet by following these instructions.

- (1) Go to this website:

<http://www.gpoaccess.gov/cfr/index.html>

- (2) Search for the appropriate subsection by using this search format "49CFR180.209" (quotation marks are required).
- (3) View the information found as text.

6.5 RE-QUALIFICATION OF DOT-8 SERIES CYLINDERS.

Each owner of a DOT-8 series cylinder used to transport acetylene must have the cylinder shell and porous filler re-qualified in accordance with CGA Pamphlet C-13 (IBR, see 49 CFR Subsection 171.7). Re-qualification must be performed in accordance with the schedule found in Table 6-2. Each of the following requirements also applies.

- a. The acetylene cylinder must be re-qualified by a person who holds a RIN.

- b. If a cylinder valve is replaced, a cylinder valve of the same weight must be used or the tare weight of the cylinder must be adjusted to compensate for the valve weight differential.
- c. The person performing the visual inspection or re-qualification must record the results as specified in 49 CFR Subsection 180.215.
- d. The person performing the visual inspection or re-qualification must mark the cylinder as specified in 49 CFR Subsection 180.213.

6.6 VISUAL INSPECTIONS.

A cylinder conforming to a specification listed in Table 6-3 and used exclusively in the gas service indicated may, instead of a periodic hydrostatic test, be given a complete external visual inspection at the time that periodic inspection becomes due. The external visual inspection must be in accordance with CGA Pamphlet C-6 or C-6.3 as applicable (IBR, see 49 CFR Subsection 171.7). When this inspection is used instead of hydrostatic pressure testing, subsequent inspections are required at 5-year intervals after the first inspection. Inspections must be made only by persons holding a current RIN and the results recorded and maintained in accordance with 49 CFR Subsection 180.215. Records must include:

- Date of Inspection (month and year)
- DOT Specification Number
- Cylinder Identification (registered symbol and serial number, date of manufacture, and owner)
- Type of Cylinder Protective Coating (including statements as to need of refinishing or recoating)
- Conditions Checked (e.g., leakage, corrosion, gouges, dents, or digs in shell or heads, broken or damaged footing or protective ring, or fire damage)
- Disposition of Cylinder (returned to service, returned to cylinder manufacturer for repairs, or condemned)

A cylinder passing re-qualification by the external visual inspection must be marked in accordance with 49 CFR Subsection 180.213. Specification cylinders must be in exclusive service with the gas indicated in Table 6-3.

Table 6-1. Hydrostatic Retest Periods

Specification Under Which the Cylinder Was Manufactured ¹	Re-Qualification Period in Years per 49 CFR Subsection References
DOT 3A, 3AA	5, 10, or 12 [see 180.209(b), (f), (h), (j)]
DOT 3AL	5 or 12 [see 180.209(j)]
3B, 3BN	5 or 10 [see 180.209(f)]
4B, 4BA, 4BW, 4B-240ET	5, 10, or 12 [see 180.209(e), (f), (j)]
8, 8AL	10 or 20 [see 180.209(i)]
Foreign cylinders (see 49 CFR Subsection 173.301(j) for restrictions)	5 [see 180.209(l) and 180.213(d)(2)]
¹ For cylinders not listed in this table refer to 49 CFR, Subsection 180.209.	

Table 6-2. Re-Qualification of DOT-8 Series Cylinders

Date of Cylinder Manufacture	Shell (Visual Inspection) Re-Qualification		Porous Filler Re-Qualification	
	Initial	Subsequent	Initial	Subsequent
Before 1 JAN 91	Before 1 JAN 01	10 years	Before 1 JAN 11	Not required
On or After 1 JAN 91	10 years ¹	10 years	3 – 20 years ²	Not required
¹ Years from date of manufacture.				
² For a cylinder manufactured on or after 1 JAN 1991, re-qualification of the porous filler must be performed no sooner than 5 years, and no later than 20 years, from the date of manufacture.				

Table 6-3. Visual Inspections

Cylinders Conforming to – ¹	Used Exclusively For –
DOT 3A, DOT 3AA, DOT 3A480X, DOT 4AA480	Anhydrous ammonia of at least 99.95% purity.
DOT 3A, DOT 3AA, DOT 3A480X, DOT 3B, DOT 4AA480, DOT 4B, DOT 4BA, DOT 4BW	Cyclopropane that is commercially free from corroding components.
DOT 3A, DOT 3AA, DOT 3A480X, DOT 4B, DOT 4BA, DOT 4BW, DOT 4E	Chlorinated hydrocarbons and mixtures thereof that are commercially free from corroding components.
DOT 3A, DOT 3AA, DOT 3A480X, DOT 4B, DOT 4BA, DOT 4BW, DOT 4E	Fluorinated hydrocarbons and mixtures thereof that are commercially free from corroding components.
DOT 3A, DOT 3AA, DOT 3A480X, DOT 3B, DOT 4B, DOT 4BA, DOT 4BW, DOT 4E	Liquefied petroleum gas that meets the requirements limits in Table 1 of ASTM 1835, Standard Specification for Liquefied Petroleum (LP) Gases (incorporated by reference 49 CFR 171.7) or an equivalent standard containing the same limits.
DOT 3A, DOT 3AA, DOT 3B, DOT 4B, DOT 4BA, DOT 4BW, DOT 4E	Methylacetylene-Propadiene (MAPP), stabilized, that is commercially free from corroding components.
¹ For cylinders not listed in this table refer to the Code of Federal Regulations, 49 CFR Subsection 180.209.	

CHAPTER 7

LEAK TEST REQUIREMENTS

7.1 PURPOSE.

The information contained in this chapter will provide leak test guidance requirements and instructions for leak testing compressed gas cylinders.

7.2 LEAK TESTING.

A leakage test shall be performed on all cylinders that have been filled with a compressed gas IAW the fill Contract/Delivery Order. Each cylinder shall be tested at all points that may provide a point of escape for the cylinder contents. Points to inspect are the safety devices in the head and bottom of acetylene cylinders, points on each cylinder valve, such as the stem, the safety device; the valve inlet threads, and the valve outlet. Tests shall be performed IAW this chapter.

7.3 LEAK TEST REQUIREMENTS.

- a. Receiving (base supply) – a leak test shall be performed on all filled cylinders received by base supply from a commercial contractor to include chlorine cylinders.
- b. Storage (base supply and using activities) – cylinders containing gas while in storage shall be leak tested every 12 months with the exception of chlorine cylinders. Chlorine cylinders shall be leak tested every 6 months.

NOTE

A cylinder is considered in storage if it is not physically connected to a system or piece of equipment. This includes full or partially charged cylinders, with or without a valve cover, sitting outside, in a warehouse, or a storage area.

7.4 LEAK TEST INSTRUCTIONS.

The following instructions give a primary and an alternate method of leak testing cylinders. However, the alternate method for leak testing chlorine cylinders is different and will be addressed in Step c.

- a. Primary Leak Test Method – an ultrasonic leak detection system, NSN 6635-01-156-3927 (Ultraprobe 2000 or its equivalent) should be used in cylinder gas leak detection. This leak detector is

rated as intrinsically safe for use in Class I, Division I, Groups A, B, C, and D hazardous classified locations. Leak test the cylinders in the areas stated in Paragraph 7.2. If a leak is discovered, immediate action shall be taken IAW Paragraph 7.5 or Paragraph 7.6.

- b. Alternate Leak Test Method (except chlorine) – if the approved electronic leak detector is not available, then the following method may be used. Each cylinder, except chlorine cylinders, will be tested for leaks by brushing a leak test compound, conforming to MIL-PRF-25567, over all portions of the valve except the outlet. Additionally, leak test compound will be applied over the area between the valve and cylinder assembly. Each cylinder will be tested for leakage through the valve when closed by means of a tube connected from the valve outlet to a container of water. Care should be taken to insure that the water or soap solution is not brought into contact with the valve outlet. All other areas stated in Paragraph 7.2 shall be checked with leak test compound. If a leak is discovered, immediate action shall be taken IAW Paragraph 7.6.

WARNING

CHLORINE GAS CYLINDERS: Personnel performing leak test utilizing ammonia hydroxide will wear splash-proof goggles and rubber gloves, due to the strong alkali content which may cause skin or eye irritation or burns.

- c. Alternate Leak Test Method (chlorine only) – if the approved electronic leak detector is not available then the following method may be used. To find a chlorine leak, tie a cloth to the end of a stick, soak the cloth with commercial grade ammonia water, Type 1, NSN 6810-00-817-9929, and hold within 1–2 inches of the valve and cylinder area. Check the complete outside area of the cylinder and bottom since these cylinders do rust through very fast because chlorine, in the presence of moisture, becomes highly corrosive hydrochloric and hypochlorous acids. A white cloud of ammonium chloride will form where there is a chlorine leak. Immediately clear the contaminated area of all personnel and keep them upwind from the leak. Immediate action shall be taken IAW Paragraph 7.5.

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7.5 LEAKING CYLINDERS, CHLORINE.



Chlorine, if inhaled can cause serious or fatal effects.

- a. If a chlorine cylinder is found to be leaking, all personnel shall be immediately evacuated from the area, in a direction upwind of the leak. The Fire Department and Safety Office shall immediately be notified.
- b. If problems are encountered that are beyond the capabilities of local authorities advice and/or assistance will be solicited from the Chlorine Emergency Plan (CHLOREP) which operates 24 hours a day with the following phone numbers: 1-800-424-9300, CONUS and Canada, Puerto Rico, Virgin Islands (Area Code 202) 483-7616, from overseas, Alaska, Hawaii (call collect).

NOTE

The CHLOREP has been established by the United States and Canadian chlorine producers and is managed by the Chlorine Institute and the Chemical Transportation Emergency Center (CHEMTREC). When activated by telephone in the event of a chlorine emergency, trained industry experts are immediately put in touch with the scene. These experts will evaluate the seriousness of the accident or emergency and will give recommendations and advice. If the situation is beyond the capabilities of a CONUS activity, CHLOREP experts will physically respond to the accident or emergency scene with the equipment to resolve the problem.

7.6 LEAKING CYLINDERS, EXCEPT CHLORINE.

If a cylinder is found to be leaking, appropriate action will be taken depending on the type of gas leaking; toxic,

flammable, or asphyxiant. If a situation exists that is deemed potentially hazardous, the Fire Department and Safety Office shall be notified immediately. However, in most cases the situation can be handled in a safe manner using normal operating procedures. If a situation exists that cannot be handled using normal operating procedures and is beyond the capabilities of local authorities, advice will be solicited from the DOT.

- a. Leaking Cylinders, Toxic Gas – personnel handling cylinder containing toxic gas shall have the appropriate gas mask or self-contained breathing apparatus and protective clothing available at all times. If a cylinder is found to be leaking, the appropriate breathing apparatus and protective clothing shall be worn and the cylinder removed outdoors and/or to a well-ventilated location away from personnel, buildings, or public roads. All personnel not equipped with the required safety equipment will be excluded from the area.
- b. Leaking Cylinders, Flammable Gas – if a cylinder containing flammable gas is found to be leaking, immediately shut off all sources of ignition. Insure cylinder is in a well-ventilated location and exclude personnel from that area.
- c. Leaking Cylinders, Asphyxiant Gas – if a cylinder containing an asphyxiant gas is found to be leaking, insure the area is well-ventilated.

7.7 LEAK TEST DOCUMENTATION.

- a. When a cylinder has been leak tested and found not to be leaking, annotate the cylinder DD Form 1574, Yellow Tag, as follows: LK, CK, C/W (DATE) IAW 42B5-1-2.
- b. When a cylinder has been leak tested and is found leaking, remove the cylinder DD Form 1574, Yellow Tag, and replace with a DD Form 1577-2, Green Tag with all necessary information.

CHAPTER 8

MAINTENANCE OF CYLINDERS

8.1 PURPOSE.

The purpose of this chapter is to provide references in the maintenance of compressed gas cylinders. Maintenance of U.S. Government/Air Force owned cylinders shall be limited to external cleaning, replacement of valve dust caps or plugs, valve handwheels, and valve protection caps.

8.2 RESPONSIBILITY.

Maintenance and repair beyond the scope of that indicated above for in-storage maintenance cylinders will be performed by commercial contractors or by approved depot activities. Maintenance to be performed by commercial contracts, Defense Logistics Agency (DLA) Depot maintenance and/or military service maintenance activities will be coordinated through HQ DLA. All maintenance performed by either commercial or military activities shall be performed IAW MIL-STD-1411.

8.3 CLEANING.

- a. External Cleaning – when necessary, cylinders shall be cleaned using compounds conforming to Specification MIL-PRF-87937. Cylinders shall be tested for leaks before cleaning because leaking gas could react with the cleaning compound. See Paragraph 7.4.
- b. Internal Cleaning – internal cleaning will be performed by commercial contractor or by approved depot military activities IAW MIL-STD-1411.

8.4 PAINTING.

Painting of cylinders will be performed by commercial contractor or by approved depot/military activities that have the qualified personnel and facilities. Painting shall be performed IAW MIL-STD-1411 following the color coding specified in MIL-STD-101.

CHAPTER 9

COMPRESSED GAS CYLINDER COLOR CODING AND VALVE REQUIREMENTS

9.1 PURPOSE.

The purpose of this chapter is to provide the proper color coding, cylinder valve outlet connections, and valve outlet caps and plugs for compressed gas cylinders.

9.2 Painting, painting materials, and color coding of cylinders are defined in MIL-STD-101, Color Codes for Pipelines and Compressed Gas Cylinders.

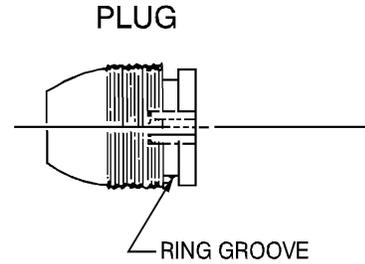
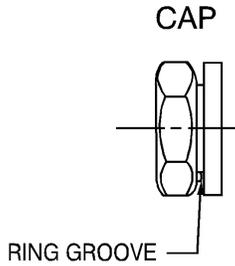
9.3 Information in Table 9-1 illustrates the type of product (gas) plus cylinder color coding and applicable valve outlet connections for cylinders utilized by the Air Force. ■ Reference Military Specification MIL-DTL-2 for valve connections on gases not listed in this chapter.

9.4 Valve outlet connection caps and plugs as specified in MIL-DTL-2 are designed to form a secondary seal and/or to prevent contamination of the valve outlet port. The requirement for valve outlet connection caps or plugs are as follows (reference Figure 9-1):

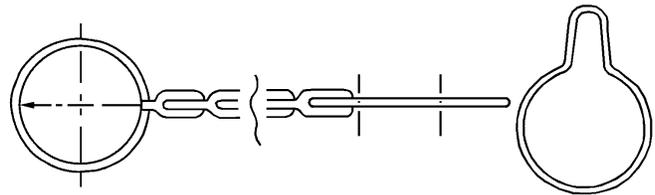
- a. To form a secondary seal on full chlorine and phosgene cylinders, caps and plugs are mandatory.

All toxic and poisonous gases such as carbon monoxide, fluorine, and hydrogen sulfide requires outlet caps/plugs.

- b. Valve outlet connection caps/plugs designed to prevent contamination of valve outlet port are required on aviators breathing and medical oxygen, medical carbon dioxide, medical oxygen-helium mixtures, and air for human respiration. Valve outlet caps/plugs are not mandatory on empty cylinders; however, if a cap/plug is attached to a cylinder, it shall be securely installed on the valve outlet. If cylinder requires mandatory outlet caps/plugs, this shall be stated in the purchase order when ordering full cylinders.
- c. All other gases not meeting the above criteria need not have valve outlet caps/plugs, but when available, they may be used for all shipments. Valve outlet caps/plugs shall be wrench tight to preclude leaking if valve connection is accidentally opened.
- d. Plastic caps/plugs are not authorized and shall not be installed on Air Force cylinders.



RETAINING RINGS WITH CHAIN



CAP NUMBER	MIL-SPEC VALVE MIL-DTL-2/NO.	OUTLET CONNECTION NO.
-200	3	200
-280	27	280
-300	23	300
-320	15, 16	320
-326	37	326
-346	5, 48	346
-350	18, 19, 29	350
-540	39, 41	540
-660	22, 43	660
-677	51	677
-680	56	680
-820	20, 21	820

PLUG NUMBER	MIL-SPEC VALVE MIL-DTL-2/NO.	OUTLET CONNECTION NO.
-240	7, 8, 9, 10	240
-510	1, 2, 14, 24, 44	510
-580	11	580
-590	6, 26, 46	590

(The part number for a specific cap or plug shall include MIL-DTL-2 plus the applicable dash number above.)

Example: MIL-DTL-2-540



Figure 9-1. Cylinder Valve Caps and Plugs

Table 9-1. Color Coding Plus Outlet Valves

Paragraph	Gas or Product	Cylinder Color Code				Military Specification Valve Part Number	Valve Outlet Connections	Valve Outlet Threads
		Top A	Band B	Band C	Body			
10.3.1	Acetylene	Yellow	Yellow	Yellow	Yellow	MIL-DTL-2/1 MIL-DTL-2/2 MIL-DTL-2/3	510 510 200	0.825-14NGO-LH-INT 0.825-14NGO-LH-INT 0.625-20NGO-RH-EXT
10.3.3	Air (water pumped) (oil pumped) Air, compressed breathing – self-contained breathing apparatus cylinders Air, compressed breathing – self-contained breathing apparatus cylinders requiring subdued colors or camouflage	Black Black White	Green Green Green	Black Black White	Black Black White	MIL-DTL-2/5 MIL-DTL-2/6 MIL-DTL-2/48	346 590 346	0.825-14NGO-RH-EXT 0.965-14NGO-LH-INT 0.825-14NGO-RH-EXT
10.3.4	Ammonia Anhydrous	Brown	Yellow	Orange	Orange	MIL-DTL-2/7 MIL-DTL-2/8 MIL-DTL-2/9 MIL-DTL-2/10	240 240 240 240	3/8-18NGT-RH-INT 3/8-18NGT-RH-INT 3/8-18NGT-RH-INT 3/8-18NGT-RH-INT
10.3.5	Argon (oil free) Argon (6000 psi) (oil free)	Gray Gray	White White	Gray Gray	Gray Gray	MIL-DTL-2/11 MIL-DTL-2/51	580 677	0.965-14NGO-RH-INT 1.030-14NGO-LH-EXT
10.3.6	Butane	Yellow	Orange	Yellow	Yellow	MIL-DTL-2/14	510	0.825-14NGO-LH-INT
10.3.7	Carbon Dioxide (fire only) Medical Medical	Red Gray Gray	Red Gray Gray	Red Gray Gray	Red Gray Gray	MIL-DTL-2/15 MIL-DTL-2/16 MIL-DTL-2/17	320 320 940	0.825-14NGO-RH-EXT 0.825-14NGO-RH-EXT 942 Yoke Connection
10.3.8	Carbon Monoxide	Yellow	Brown	Brown	Brown	MIL-DTL-2/18	350	0.825-14NGO-LH-EXT
10.3.9	Carbon (fumigant)	Buff	Blue	Buff	Buff	MIL-DTL-2/19	350	0.825-14NGO-LH-EXT
10.3.10	Chlorine	Brown	Brown	Brown	Brown	MIL-DTL-2/20 MIL-DTL-2/21	820 820	0.75-14NGT(CI)-1 0.75-14NGT(CI)-1
10.3.11	Dichlorodifluoromethane (Freon) (refrigerant)	Orange	Orange	Orange	Orange	MIL-DTL-2/22	660	1.030-14NGO-RH-EXT
10.3.12	Ethyl Chloride	Buff	Blue	Yellow	Buff	MIL-DTL-2/23	300	0.825-14NGO-RH-EXT

Table 9-1. Color Coding Plus Outlet Valves - Continued

Paragraph	Gas or Product	Cylinder Color Code				Military Specification Valve Part Number	Valve Outlet Connections	Valve Outlet Threads
		Top A	Band B	Band C	Body			
10.3.13	Ethylene Oxide	Yellow	Blue	Buff	Buff	MIL-DTL-2/24	510	0.825-14NGO-LH-INT
10.3.14	Helium (oil free or medical)	Buff	Gray	Gray	Gray	MIL-DTL-2/11	580	0.965-14NGO-RH-INT
10.3.15	Helium (oil pumped)	Gray	Orange	Gray	Gray	MIL-DTL-2/26	590	0.965-14NGO-LH-INT
10.3.16	Helium-Oxygen Mixture	Buff	White	Green	Green	MIL-DTL-2/27	280	0.745-14NGO-RH-EXT
10.3.17	Helium-Oxygen Mixture	Buff	White	Green	Green	MIL-DTL-2/28	890	892 Yoke Connection
10.3.18	Hydrogen	Yellow	Black	Yellow	Yellow	MIL-DTL-2/29	350	0.825-14NGO-LH-EXT
10.3.19	Methyl Chloride	Yellow	Brown	Orange	Orange	MIL-DTL-2/22	660	1.030-14NGO-RH-EXT
10.3.20	Nitrogen (oil free) (oil tolerant)	Gray	Black	Black	Gray	MIL-DTL-2/11	580	0.965-14NGO-RH-INT
		Gray	Black	Gray	Gray	MIL-DTL-2/56	680	1.045-14NGO-RH-INT
		Gray	Black	Gray	Gray	MIL-DTL-2/26	590	0.965-14NGO-LH-INT
10.3.21	Nitrous Oxide Medical	Blue	Blue	Blue	Blue	MIL-DTL-2/37	326	0.825-14NGO-RH-EXT
						MIL-DTL-2/38	910	912 Yoke Connection
10.3.22	Oxygen (ABO or tech.) Medical	Green	White	Green	Green	MIL-DTL-2/39	540	0.903-14NGO-RH-EXT
	Medical	White	Green	Green	Green	MIL-DTL-2/41	540	0.903-14NGO-RH-EXT
	Medical	White	Green	Green	Green	MIL-DTL-2/42	870	872 Yoke Connection
10.3.23	Phosgene	Brown	Orange	Brown	Brown	MIL-DTL-2/43	660	1.030-14NGO-RH-EXT
10.3.24	Propane	Yellow	Orange	Yellow	Yellow	MIL-DTL-2/44	510	0.885-14NGO-LH-INT
10.3.25	Sulphur Dioxide	Brown	Gray	Brown	Brown	MIL-DTL-2/22	660	1.030-14NGO-RH-EXT
10.3.26	Sulphur Hexafluoride	Gray	White	Black	Gray	MIL-DTL-2/46	590	0.965-14NGO-LH-INT

CHAPTER 10

SUPPLY, STORAGE, DISPOSITION, AND SHIPPING REQUIREMENTS

10.1 PURPOSE.

The purpose of this chapter is to provide instructions in the supply, storage, disposition, and shipping of compressed gas cylinders to Air Force activities CONUS or overseas.

10.2 SUPPLY.

Compressed gas cylinders, cylinder valves, valve outlet connections, and related equipment for use by Air Force installations, both CONUS and overseas, are stock listed in Federal Stock Class (FSC) 8120 and 3655. Federal stock numbers of compressed gas cylinders, valves, and outlet connection, are set forth in current issues of DoD, Federal Supply Catalog FSC 8120 and 3655.

- a. Identification of Cylinders – filled compressed gas cylinders will be identified with 2 tags (DD Form 1574). One tag will identify the content of cylinder and the other will identify the cylinder. This is in addition to the DOT label. When the cylinder is depleted, the DD Form 1574 tag pertaining to the content will be removed, and the cylinder identification DD Form 1574 tag will be over stamped MT to indicate that it has been exhausted to 5 – 38 psig pressure. Do not remove the DOT label. When a depleted cylinder is known to have changed condition, the DD Form 1574 will be removed and DD Form 1577-2 tag attached. This is the responsibility of the using activity. Medicinal gases managed by Defense Personnel Support Center (DPSC) and cataloged in FSC 6505 will be tagged IAW applicable Defense Medical Purchase Description (DMPD). The DOT label will be removed/replaced by the filling agency only.
- b. Supply Source of Issue – the supply and issue of the various gas cylinders may be so regulated between supplying agency and using activity to insure that the oldest hydrostatic test date is issued first, thereby allowing the least possible number of filled cylinders remaining unused at the expiration date of the 5-year (quinquennial) test period.
- c. For those activities that have a rapid turnover of cylinders, the FIRST IN, FIRST OUT issuing procedure may be used. The intent of this paragraph is to give the commands/bases an option as to how to store and issue cylinders in order that the method used best suits the needs of the commands/bases.
- d. Particular Cylinders – compressed gas cylinders utilized by overseas Air Force activities not having cylinder maintenance equipment available within

theatre or commercial source for local purchase of cylinder maintenance and which do not have commercial source or generators from which to obtain gases will return such cylinders as follows:

- (1) Helium – empty cylinders shall be returned to addresses set forth by instructions on the shipping document. Contact WR-ALC/AFTT, Wright-Patterson AFB, OH 45433-7632, if return address is not known.
- (2) Oxygen – empty cylinders shall be returned to the organization that supplied the cylinders. Aviator's Breathing Oxygen (ABO) should be procured to the MIL-PRF-27210 specification. Further guidance for procuring ABO can be found in T.O. 42B6-1-1. Air Force ABO requirements are managed by WR-ALC/AFTT, Wright-Patterson AFB, OH 45433-7632.
- e. Partially Charged Cylinders – cylinder applications which require removal from service with 50% or more of the cylinder content remaining can be utilized.
 - (1) These cylinders shall be used for intrabase requirements, and will never be shipped to other bases, or stored with full or empty cylinders. When utilization is not feasible, high-pressure gas and liquid gas cylinders should be relieved of contents to 5 – 38 psig if local facilities and regulation permit, and then returned to the filling contractor, gas supply facility, or storage. When facilities and/or regulation do not permit relieving cylinder contents, they will be shipped and/or stored partially filled.
 - (2) The partially used cylinders will be tagged with a DD Form 1577-2 and checked for leaks immediately after removal from service. The DD Form 1577-2 shall note the specific residual cylinder pressure and the statement NOT SERVICEABLE FOR (UNIT DESIGNATION) PURPOSES.
 - (3) Cylinder contents should always be checked by pressure or weight prior to use by the using activity. If the pressure or weight is within 10% of the amount marked on the DD Form 1577-2, the cylinder valve is serviceable. If pressure or weight go below this limit, check for leaking valve, and note on the DD Form 1577-2 if a leak is discovered.

10.3 GENERAL STORAGE.

Personnel who handle or use compressed gases, liquids in cylinders or gas cylinders shall be trained to recognize the hazards of the materials and danger of improperly handling cylinders or associated equipment. Additionally, personnel must recognize the factors which could cause a change in the condition of the cylinders or their contents. Some general guidelines for storage, handling, and use are as follows:

- a. Cylinders must be protected against excessive rise or fall of temperature. Cylinders will be stored inside wherever possible, and, if not, they may be stored in the open but must be protected from extreme weather conditions, and also from the ground to prevent rusting. Cylinders stored in the open must be protected from accumulation of ice and snow. In the summer, cylinders stored in this manner will be protected or screened against direct rays of the sun. Ventilation will be provided to keep temperatures below 125°F (51.6°C) and carry off leakage of flammable gases.
- b. Cylinders should never be stored near highly combustible materials such as oil, gasoline, waste, etc. The segregation of compressed gas cylinders can be accomplished using one of the following guidelines:
 1. A minimum of 50 feet will be maintained between gas cylinders and combustible material
 2. In accordance with the National Fire Protection Association (NFPA) 55 guidelines, gas cylinders should be isolated from any incompatible or combustible material storage by a barrier of noncombustible material at least 5 feet (1.5 meter) high that has a minimum fire resistance rating of 30 minutes
- c. Where gases of different types are stored at the same location, cylinders shall be grouped by type of gas, and the groups arranged to take into account the gases contained. Cylinders will be prominently labeled as (1) Flammable Gas, (2) Poison (or Poison Gas), or (3) Nonflammable Gas in accordance with DOT regulations. If a secondary hazard is present in conjunction with 1 of the 3 previously mentioned labels (such as Flammable Gas and Poison) segregation and compatibility of the secondary hazard must be provided within the primary hazard grouping. Full and empty cylinders should be stored so that cylinders comprising the old stock can be removed first with a minimum handling of other cylinders. The facility shall be prominently posted with the name of the gases to be stored. In addition to the precaution required for the safe

storage of any compressed gas cylinder, the following practices must be observed for chlorine cylinders: Never store chlorine cylinders next to cylinders containing any other compressed gases. Similarly, never store chlorine cylinders near turpentine, ether, anhydrous ammonia, finely divided metals, hydrocarbons (such as oil, grease, and gasoline), or any flammable materials.

- d. Care will be taken to protect cylinders from any object which might cut or damage their surfaces. Cylinders will not be stored at a place where heavy moving objects may strike or fall on them.
- e. Cylinders should not be exposed to continuous dampness and should not be stored near salt or other corrosive chemicals or fumes. Corrosion may damage cylinders and may cause the valve protection caps to stick.
- f. Measures will be taken to prevent cylinders from being knocked over when stored upright. At a minimum, metal chain, straps, braces, or other restraining devices will be used. Nylon straps shall not be used on flammable gases.
- g. Cylinders shall be secured in an upright or in a horizontal position. DOT-4L cylinders must be stored in an upright position and it is preferable to store acetylene cylinders in an upright position to avoid solvent loss.

10.4 DISPOSITION OF CYLINDERS.

Disposal of compressed gas cylinders will be accomplished IAW DoD 4160.21-M, Defense Materiel Disposition Manual and the procedures contained in AFMAN 23-227 (AFJMAN 23-227). The following are general instructions in the disposition of cylinders:

- a. General – nongovernment owned cylinders shall be returned to the owner. If the owner cannot be determined, the cylinder will be processed IAW DoD 4160.21-M. Government owned cylinders in the DLA inventory may be shipped to a Defense Property Disposal (DPD) Office for any of the following reasons:
 - (1) Cylinders that have been condemned for physical defects as outlined in Chapter 5 of this technical order.
 - (2) Cylinders returned from a fill or repair contractor indicating failure to pass the hydrostatic test.
 - (3) Foreign made cylinders that were not manufactured to CTC, DOT, or ICC specifications and certain U.S. manufactured cylinders outlined in Chapter 5 of this technical order.

- (4) A cylinder with dimensions and/or capacity that cannot be related to a valid NSN.
 - (5) Cylinders declared excess or surplus to known or anticipated requirements of the government by the managing activity.
 - (6) Cylinders whose ownership cannot be determined and are presumed to be nongovernment owned; and after the necessary documentation has been completed to declare the cylinders as government owned, and the inventory manager has directed that they be declared excess.
 - (7) DOT Specification 39 cylinders identified as nonrefillable disposable shall be disposed of by the user immediately after the cylinder is completely empty. Since it is a violation of 49 CFR to reuse the container, the valve shall be removed, the container punctured with a sharp tool, and the container collapsed.
- b. Preparation of Cylinders for Disposition – cylinders rejected either as a result of failure to pass the hydrostatic test or for any other reason will be disposed of as condemned property IAW the instructions as set forth in AFMAN 23-110 after the identification numbers and symbols and cylinder content have been destroyed in the following manner:
- (1) The content of an unserviceable cylinder should be discharged safely by burning flammable gases or by discharging noxious gases through vent tubing to a safe area and the cylinder purged of any flammable gas or gas mixture before any attempt is made to destroy the cylinder. It is desirable to have the content of cylinders removed only by qualified persons or under their supervision.
 - (2) If the content of a cylinder must be removed by some method other than through a properly operating valve, care must be used to release the content slowly so that the released energy does not cause the cylinder to rocket. Under such circumstances, it is recommended that the cylinder be firmly held in a vise or by other suitable means so that any danger of the cylinder being tossed around, out of control, is minimized. In addition, the discharge connection of the cylinder valve should be connected through tubing and a needle valve to prevent excessive discharge rates.
 - (3) In the event that a cylinder valve is damaged, preventing the discharge of the commodity in a normal manner, it may be possible to release the pressure in the cylinder through the safety device. This procedure is not generally recommended and should not be attempted where the

gas content may be noxious or where the ejection of the safety-relief device under pressure may be hazardous, without proper protection to personnel and discarding into a safe location. The use of this method of releasing cylinder content should be restricted to qualified persons familiar with gas cylinders and their safety devices.

- (4) Many of the compressed gases may be safely vented to the atmosphere. Obviously the inert gases can be so vented without creating any undue hazard. If flammable gases or gases which may present a health hazard are vented to the atmosphere, it should be done very carefully and at an isolated location in such a manner and at such a rate as is necessary to assure safety from fire or contamination of the atmosphere.

WARNING

This procedure may result in an explosion with flying shrapnel. Failure to adhere to the following safety guidelines could result in severe injury or death.

- (5) As an extreme means of discharging the gas contained in an unserviceable cylinder, where the valve is damaged to such an extent that it cannot be used for the release of gas, it is possible to accomplish release of pressure by perforating the cylinder with a high-powered rifle bullet. This method should be used only as a last resort. This should only be done in situations where the cylinder cannot be safely shipped to a qualified repair facility equipped to safely remove the broken valve. It should only be attempted by qualified individuals at a suitable isolated place, with the cylinder located where possible in a depression below the surrounding grade level. The rifle should be fired from a distance of greater than 50 yards from the cylinder through a protective shield that is thick enough to protect personnel from any flying fragments. The cylinder should be secured to prevent the escaping gas from propelling the cylinder in a rocket-like manner. Certain gases present a greater danger than others. Oxygen, acetylene, and propane cylinders will react more violently than cylinders containing inert gases such as nitrogen and argon. The procedure needs to be carefully evaluated when the gas cylinder contains a toxic gas such as chlorine. Wind direction and speed must be considered. Before attempting this procedure, contact your Explosive Ordnance Disposal (EOD) Office. All the above procedures must be reviewed and approved by the Base Safety

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Office and Bio-Environmental Engineering (BEE), for each cylinder to be opened in this manner.

- (6) For disposal of hazardous gases or liquids in cylinders, where specific instructions are not available, contact the contractor supplier or producer of that particular product for procedures of disposal.
 - (7) After releasing the pressure and discharging the content from an unserviceable cylinder, the cylinder should be purged, if it previously contained a flammable or toxic material, before any attempt is made to destroy it with a cutting torch. Purging can be accomplished with the use of inert gases, steam, or by filling the cylinder with water.
 - (8) Having removed the gas content of a cylinder and after purging it if it previously contained a flammable or toxic gas as mentioned in Step (6) above, the empty cylinder may be destroyed with a cutting torch, or by other appropriate means that will make it unusable as a pressure vessel. It is recommended that the ICC, DOT, or CTC markings on the cylinder be destroyed with a torch and that the remainder of the cylinder be cut into 2 or more pieces, or that it be destroyed by other suitable means.
- c. Disposal of Unserviceable Acetylene Cylinders – cylinders marked ICC-8, ICC-8AL, DOT-8, CRC-8, CRC-8AL, BTC-8, BTC-8AL are authorized for acetylene only. These cylinders are filled with a porous mass which serves as an absorbent for a solvent that is utilized to retain acetylene in solution. An unserviceable acetylene cylinder, therefore, may retain varying quantities of solvent and gas. Before attempting to destroy one of these cylinders, it is important that every precaution be taken to de-energize the cylinder. It is always best to have this work done by personnel completely familiar with these cylinders. The following procedures should be observed:

- (1) The cylinder should be removed to an isolated location where escaping gas will present no hazard to personnel or property. The location shall be remote from any place where people may work or assemble.
- (2) The cylinder valve should be opened and should remain open for at least 24 hours to permit the discharge of residual acetylene.
- (3) The cylinder valve should be removed very carefully, making sure that all gas pressure has been released before completely unscrewing the valve. This operation should be performed with caution to prevent accident in the event of

release of gas which may be retained in the cylinder if the valve happened to be clogged.

- (4) After removal of valve, fill cylinder with water. This will dilute the vapors in the cylinder. Let cylinders sit for 2 hours, then make a circumferential cut midway in the cylinder using a hacksaw.
- (5) If large quantities of cylinders exists, remove all safety devices from the cylinders. It should be noted that these devices may be in both ends of the cylinder.
- (6) The cylinder should be placed in a horizontal position. If there is more than 1 cylinder, they should be stacked, 1 cylinder wide and not more than 5 cylinders high. Wood or other fuel should be placed around the cylinders and ignited. The cylinders should be kept in an intense fire for at least 6 hours.
- (7) After 6 hours in the fire, apply a flame to the valve spud so as to ignite any acetone vapors which may issue from the opening. This can be readily done by using a lighted cutting torch.
- (8) Using a cutting torch, cut out the valve spud and all markings on the head of the cylinder, including the registered symbol, serial number, and other identification marks.
- (9) Using a cutting torch, make a circumferential cut midway in the cylinder so the filler can be cracked and the cylinder broken in half.
- (10) Allow the cylinder halves to lie as long as acetone vapors continue to burn.

10.5 SHIPPING.

- a. Cylinders will be shipped IAW the instructions as set forth in the applicable portions of AFMAN 23-110 and AFMAN 24-204. Cylinders will not be accounted for by the serial numbers stamped on the cylinder, when shipping to the filling agency. The exchange basis is cylinder for cylinder. However, when cylinders are shipped to the filling agency, and costs of services such as valve replacement, hydrostatic testing, etc., are not included in the basic price of the gas, the ordering agency/base will use the serial number stamped on the cylinder as a means of control unless it is not feasible to institute this control procedure because of some unusual circumstance. If it is impractical for the contractor to return the same serial numbered cylinders which were turned in for maintenance, the contractor may substitute different serial numbers. However, the contractors documentation must indicate which cylinder numbers were substituted against the numbers turned in for maintenance.

Otherwise, cylinders are not to be accounted for by serial numbers, and the exchange basis is cylinder for cylinder. When less than truckload lots are shipped, breathing oxygen cylinders should be covered and separated from other commodities being shipped in the same truck.

- b. Whenever cylinders are shipped in less than carload lots, each cylinder will be properly labeled for transportation purposes. Decals will not be used for marking purposes. Cylinders intended for overseas shipment will be individually labeled even though shipped domestically in carload lots. If the cylinders are empty, the lower part of the shipping tag will be torn off and any red or green labels will be removed or covered with white labels bearing the word EMPTY. Notation must be made on the Bill of Lading that cylinders are empty, if such is the case. Before shipping empty cylinders, be sure valves are closed, and the valve protection caps are in place. When not available, dust caps may be omitted from empty cylinders being shipped only to a refill or reconditioning point. Cylinders that are so constructed with recessed control valves do not require protective valve caps.
- c. Shipping Oxygen Cylinders – assure that cylinders (especially oxygen) will not be contaminated with oil, grease, paint, etc., by the shipper while en route to or from the filling agency.
- d. Shipping Acetylene Cylinders – all acetylene cylinders shall be shipped, stored, and used in the upright position. Cylinders will be secured with metal chain or strap of noncombustible material.
- e. Preparation for Shipping.
 - (1) Empty Cylinders – cylinders when classified empty shall be required to have 5 – 38 psig gage pressure. This is required to prevent ambient air from contaminating the cylinder and also allowing the cylinder to be shipped at empty cylinder rate. When the cylinder is depleted, the DD Form 1574 identifying the content will be removed and a DD Form 1574 will be affixed with the NSN for the cylinder and over stamped MT to indicate that the gas has been used/exhausted to the 5 – 38 psig pressure and is still serviceable. When a depleted cylinder is known to have changed condition, i.e., repairable, the DD Form 1574 tag will be removed and replaced with DD Form 1577-2. The DOT label will not be removed.
 - (2) Prior to shipment or refill, empty cylinders will be inspected to determine whether any dents, bulges, or other damage to the cylinders exist. Any dented or bulged cylinders will be condemned and disposed of, whenever it fails the inspection requirement in Chapter 5.

CHAPTER 11

TABLE OF INDUSTRIAL GAS CONTAINER CONTENTS

11.1 PURPOSE.

The purpose of this chapter is to give activities a means of determining the volume of gas in a cylinder. Determining the volume of contents in a cylinder is not a requirement but may be used by field activities whenever deemed necessary.

11.2 MEASUREMENTS AND DATA REQUIRED.

The contents tables (Table 11-1 through Table 11-5) in this chapter may be used when the required measurements and data are known. The contents tables which are presented in engineering units, are designed to provide a relatively easy means of determining the volume of gas at standard conditions contained in a cylinder – given the volume of the cylinder and the pressure and temperature of the gas within the cylinder. Tables are provided for each of the five gases: oxygen, argon, nitrogen, helium, and hydrogen.

For the purpose of this chapter, the following definitions are provided so that calculations can be determined:

Standard Conditions	the standard condition used in the tables are those defined as 70°F (294.26K) and 14.696 lb/in ² (0.101325 MPa).
Temperature	the temperature of the gas in the cylinder or the temperature of the cylinder itself must be determined.
Pressure	the pressure of the gas in the cylinder must be determined.
Volume	the volume of the cylinder must be known. This is usually provided by the manufacturer or supplier of the cylinder and is determined by measuring the volume or water the cylinder holds.

11.3 CALCULATIONS.

Once the temperature and pressure are determined for a particular gas, the tables are used to determine the quantity of that gas in the cylinder. The following examples are provided for calculating cylinder contents.

The following formula will be used along with the contents tables:

$$V = C \times V_T$$

Where:

- V is the volume in CU FT which the gas in the tank would occupy at standard conditions (70°F and 14.696 psig), noted as SCF.
- C is the value obtained from the contents table at the temperature and pressure of the cylinder.
- V_T is the volume of the cylinder in CU FT.

11.4 INTERPOLATION.

When gauges used to measure the temperature and pressure of the cylinder are more accurate than the increments for temperature (±2°F or ±2K) or pressure (±100 psig or ±0.5 MPa) given in the tables, it is appropriate to interpolate between the next highest and next lowest values in the tables.

11.5 CALCULATION EXAMPLES.

The following are examples in using the formulas. For the sake of simplicity, nitrogen tables will be used in all the examples, but the calculations are performed in exactly the same manner for all of the gases.

- a. Cylinder Volume Calculation — Example 1 – a nitrogen cylinder has:
 - Temperature of 68°F
 - Pressure of 2300 psig
 - Water Volume of 6575 Cubic Inches (please note we must have the volume in cubic feet, therefore $V_T = 2675/1728^2 = 1.548 \text{ ft}^3$.)

The formula from Paragraph 11.3 is: $V = C \times V_T$

From the table of 68°F and 2300 psig, we obtain

$$\begin{aligned} C &= 154.1, \text{ therefore} \\ V &= 154.1 \times 1.548 \\ V &= 238.5 \text{ SCF} \end{aligned}$$

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b. Cylinder Calculation — Example 2 (with pressure interpolation) – a nitrogen cylinder has:

- Temperature of 64°F
- Pressure of 1840 psig
- Water Volume of 4.46 ft³
- The Formula Remains the Same: $V = C \times V_T$

²One cubic foot = 1728 cubic inches. But we must interpolate to find C. This is done as follows: Look up the values in the table at 64°F for 1800 and 1900 psig. The correct value of C will be the sum of the value at 1800 psig, plus 4/10 of the difference between 1800 psig and 1900 psig, or as follows:

$$\begin{aligned} C &= 124.0 + 4/10 (130.4 - 124.0) \\ &= 124.0 + 2.56 \end{aligned}$$

$$= 126.6 \text{ (rounding off to 4 digits)}$$

The final calculation is:

$$V = 126.6 \times 4.46$$

$$V = 564.6 \text{ SCF}$$

11.6 CONTENTS TABLES.

- a. Table 11-1 — Oxygen
- b. Table 11-2 — Argon
- c. Table 11-3 — Nitrogen
- d. Table 11-4 — Helium
- e. Table 11-5 — Hydrogen

Table 11-1. Oxygen Contents Table (SCF/cu ft)

°F	100 psig	200 psig	300 psig	400 psig	500 psig	600 psig	700 psig
-40.0	9.984	18.92	28.09	37.49	47.12	57.00	67.11
-38.0	9.934	18.83	27.94	37.28	46.84	56.64	66.67
-36.0	9.885	18.73	27.79	37.06	46.57	56.29	66.24
-34.0	9.836	18.63	27.64	36.86	46.29	55.95	65.82
-32.0	9.788	18.54	27.49	36.65	46.02	55.61	65.41
-30.0	9.740	18.44	27.34	36.45	45.76	55.28	65.00
-28.0	9.693	18.35	27.20	36.25	45.50	54.95	64.60
-26.0	9.646	18.26	27.06	36.05	45.24	54.62	64.20
-24.0	9.599	18.16	26.91	35.85	44.98	54.30	63.81
-22.0	9.554	18.07	26.78	35.66	44.73	53.99	63.42
-20.0	9.508	17.98	26.64	35.47	44.48	53.67	63.04
-18.0	9.463	17.90	26.50	35.28	44.24	53.37	62.67
-16.0	9.418	17.81	26.37	35.09	43.99	53.06	62.30
-14.0	9.374	17.72	26.23	34.91	43.75	52.76	61.93
-12.0	9.331	17.64	26.10	34.73	43.52	52.47	61.58
-10.0	9.287	17.55	25.97	34.55	43.28	52.18	61.22
-8.0	9.244	17.47	25.84	34.37	43.05	51.89	60.87
-6.0	9.202	17.38	25.71	34.20	42.83	51.60	60.53
-4.0	9.160	17.30	25.59	34.02	42.60	51.32	60.19
-2.0	9.118	17.22	25.46	33.85	42.38	51.05	59.85
0.0	9.077	17.14	25.34	33.68	42.16	50.77	59.52
2.0	9.036	17.06	25.22	33.51	41.94	50.50	59.20
4.0	8.995	16.98	25.10	33.35	41.73	50.24	58.87
6.0	8.955	16.90	24.98	33.18	41.51	49.97	58.55
8.0	8.915	16.82	24.86	33.02	41.30	49.71	58.24
10.0	8.876	16.75	24.74	32.86	41.10	49.46	57.93
12.0	8.837	16.67	24.62	32.70	40.89	49.20	57.62
14.0	8.798	16.60	24.51	32.54	40.69	48.95	57.32
16.0	8.760	16.52	24.40	32.39	40.49	48.70	57.02
18.0	8.722	16.45	24.28	32.23	40.29	48.46	56.72
20.0	8.684	16.37	24.17	32.08	40.09	48.21	56.43
22.0	8.647	16.30	24.06	31.93	39.90	47.97	56.14
24.0	8.610	16.23	23.95	31.78	39.71	47.74	55.86
26.0	8.573	16.16	23.84	31.63	39.52	47.50	55.58
28.0	8.537	16.09	23.74	31.49	39.33	47.27	55.30
30.0	8.501	16.02	23.63	31.34	39.14	47.04	55.02
32.0	8.465	15.95	23.53	31.20	38.96	46.81	54.75
34.0	8.430	15.88	23.42	31.06	38.78	46.59	54.48
36.0	8.394	15.81	23.32	30.91	38.60	46.37	54.21
38.0	8.360	15.74	23.22	30.78	38.42	46.15	53.95
40.0	8.325	15.68	23.11	30.64	38.24	45.93	53.69
42.0	8.291	15.61	23.01	30.50	38.07	45.71	53.43
44.0	8.257	15.54	22.92	30.37	37.90	45.50	53.18

Table 11-1. Oxygen Contents Table (SCF/cu ft) - Continued

°F	100 psig	200 psig	300 psig	400 psig	500 psig	600 psig	700 psig
46.0	8.223	15.48	22.82	30.23	37.72	45.29	52.93
48.0	8.190	15.42	22.72	30.10	37.56	45.08	52.68
50.0	8.157	15.35	22.62	29.97	37.39	44.88	52.43
52.0	8.124	15.29	22.53	29.84	37.22	44.67	52.19
54.0	8.091	15.23	22.43	29.71	37.06	44.47	51.95
56.0	8.059	15.16	22.34	29.58	36.89	44.27	51.71
58.0	8.027	15.10	22.24	29.46	36.73	44.07	51.47
60.0	7.995	15.04	22.15	29.33	36.57	43.88	51.24
62.0	7.964	14.98	22.06	29.21	36.41	43.68	51.01
64.0	7.932	14.92	21.97	29.08	36.26	43.49	50.78
66.0	7.901	14.86	21.88	28.96	36.10	43.30	50.55
68.0	7.871	14.80	21.79	28.84	35.95	43.11	50.33
70.0	7.840	14.74	21.70	28.72	35.80	42.92	50.10
72.0	7.810	14.68	21.61	28.60	35.65	42.74	49.88
74.0	7.780	14.63	21.53	28.48	35.50	42.56	49.67
76.0	7.750	14.57	21.44	28.37	35.35	42.38	49.45
78.0	7.720	14.51	21.36	28.25	35.20	42.20	49.24
80.0	7.691	14.45	21.27	28.14	35.05	42.02	49.02
82.0	7.662	14.40	21.19	28.02	34.91	41.84	48.81
84.0	7.633	14.34	21.10	27.91	34.77	41.67	48.61
86.0	7.604	14.29	21.02	27.80	34.63	41.49	48.40
88.0	7.576	14.23	20.94	27.69	34.49	41.32	48.20
90.0	7.548	14.18	20.86	27.58	34.35	41.15	48.00
92.0	7.520	14.13	20.78	27.47	34.21	40.98	47.80
94.0	7.492	14.07	20.70	27.36	34.07	40.82	47.60
96.0	7.464	14.02	20.62	27.26	33.94	40.65	47.40
98.0	7.437	13.97	20.54	27.15	33.80	40.49	47.21
100.0	7.410	13.91	20.46	27.05	33.67	40.33	47.01
102.0	7.383	13.86	20.38	26.94	33.54	40.16	46.82
104.0	7.356	13.81	20.31	26.84	33.41	40.00	46.63
106.0	7.329	13.76	20.23	26.74	33.28	39.85	46.45
108.0	7.303	13.71	20.15	26.63	33.15	39.69	46.26
110.0	7.277	13.66	20.08	26.53	33.02	39.53	46.08
112.0	7.251	13.61	20.01	26.43	32.89	39.38	45.89
114.0	7.225	13.56	19.93	26.33	32.77	39.23	45.71
116.0	7.199	13.51	19.86	26.24	32.64	39.08	45.53
118.0	7.174	13.46	19.79	26.14	32.52	38.93	45.36
120.0	7.148	13.42	19.71	26.04	32.40	38.78	45.18
122.0	7.123	13.37	19.64	25.94	32.27	38.63	45.00
124.0	7.098	13.32	19.57	25.85	32.15	38.48	44.83
126.0	7.074	13.27	19.50	25.75	32.03	38.34	44.66
128.0	7.049	13.23	19.43	25.66	31.92	38.19	44.49
130.0	7.025	13.18	19.36	25.57	31.80	38.05	44.32

Table 11-1. Oxygen Contents Table (SCF/cu ft) - Continued

°F	800 psig	900 psig	1000 psig	1100 psig	1200 psig	1300 psig	1400 psig
-40.0	77.45	88.03	98.83	109.8	121.1	132.5	144.0
-38.0	76.93	87.41	98.11	109.0	120.1	131.4	142.8
-36.0	76.42	86.80	97.40	108.2	119.2	130.3	141.6
-34.0	75.91	86.21	96.70	107.4	118.3	129.3	140.5
-32.0	75.41	85.62	96.02	106.6	117.4	128.3	139.3
-30.0	74.92	85.04	95.35	105.8	116.5	127.3	138.2
-28.0	74.44	84.47	94.69	105.1	115.6	126.3	137.1
-26.0	73.96	83.91	94.04	104.3	114.8	125.4	136.1
-24.0	73.50	83.36	93.40	103.6	113.9	124.4	135.0
-22.0	73.04	82.82	92.77	102.9	113.1	123.5	134.0
-20.0	72.58	82.29	92.16	102.2	112.3	122.6	133.0
-18.0	72.14	81.77	91.55	101.5	111.5	121.7	132.0
-16.0	71.70	81.25	90.96	100.8	110.8	120.9	131.0
-14.0	71.26	80.74	90.37	100.1	110.0	120.0	130.1
-12.0	70.84	80.24	89.79	99.47	109.3	119.2	129.2
-10.0	70.42	79.75	89.22	98.82	108.5	118.3	128.3
-8.0	70.00	79.27	88.66	98.18	107.8	117.5	127.4
-6.0	69.59	78.79	88.11	97.56	107.1	116.8	126.5
-4.0	69.19	78.32	87.57	96.94	106.4	116.0	125.6
-2.0	68.79	77.85	87.04	96.33	105.7	115.2	124.8
0.0	68.40	77.40	86.51	95.73	105.0	114.5	123.9
2.0	68.01	76.95	85.99	95.14	104.4	113.7	123.1
4.0	67.63	76.50	85.48	94.56	103.7	113.0	122.3
6.0	67.25	76.06	84.98	93.99	103.1	112.3	121.5
8.0	66.88	75.63	84.48	93.43	102.5	111.6	120.7
10.0	66.51	75.20	83.99	92.87	101.8	110.9	120.0
12.0	66.15	74.78	83.51	92.32	101.2	110.2	119.2
14.0	65.79	74.37	83.03	91.79	100.6	109.5	118.5
16.0	65.44	73.96	82.57	91.25	100.0	108.8	117.7
18.0	65.09	73.55	82.10	90.73	99.43	108.2	117.0
20.0	64.75	73.15	81.65	90.21	98.85	107.5	116.3
22.0	64.41	72.76	81.19	89.70	98.28	106.9	115.6
24.0	64.07	72.37	80.75	89.20	97.72	106.3	114.9
26.0	63.74	71.99	80.31	88.71	97.16	105.7	114.2
28.0	63.41	71.61	79.88	88.22	96.61	105.1	113.6
30.0	63.09	71.23	79.45	87.73	96.07	104.5	112.9
32.0	62.77	70.86	79.03	87.26	95.54	103.9	112.2
34.0	62.45	70.50	78.61	86.79	95.02	103.3	111.6
36.0	62.14	70.14	78.20	86.32	94.50	102.7	111.0
38.0	61.83	69.78	77.79	85.86	93.99	102.2	110.4
40.0	61.53	69.43	77.39	85.41	93.48	101.6	109.7
42.0	61.22	69.08	77.00	84.96	92.98	101.0	109.1
44.0	60.93	68.74	76.60	84.52	92.49	100.5	108.5
46.0	60.63	68.39	76.22	84.09	92.00	99.96	107.9

Table 11-1. Oxygen Contents Table (SCF/cu ft) - Continued

°F	800 psig	900 psig	1000 psig	1100 psig	1200 psig	1300 psig	1400 psig
48.0	60.34	68.06	75.83	83.66	91.52	99.43	107.4
50.0	60.05	67.73	75.46	83.23	91.05	98.90	106.8
52.0	59.76	67.40	75.08	82.81	90.58	98.38	106.2
54.0	59.48	67.07	74.71	82.40	90.12	97.87	105.7
56.0	59.20	66.75	74.35	81.99	89.66	97.37	105.1
58.0	58.93	66.43	73.99	81.58	89.21	96.87	104.6
60.0	58.65	66.12	73.63	81.18	88.77	96.38	104.0
62.0	58.38	65.81	73.28	80.78	88.32	95.89	103.5
64.0	58.12	65.50	72.93	80.39	87.89	95.41	103.0
66.0	57.85	65.20	72.58	80.01	87.46	94.94	102.4
68.0	57.59	64.89	72.24	79.62	87.03	94.47	101.9
70.0	57.33	64.60	71.90	79.24	86.61	94.01	101.4
72.0	57.07	64.30	71.57	78.87	86.20	93.55	100.9
74.0	56.82	64.01	71.24	78.50	85.79	93.09	100.4
76.0	56.57	63.72	70.91	78.13	85.38	92.65	99.93
78.0	56.32	63.44	70.59	77.77	84.98	92.20	99.44
80.0	56.07	63.15	70.27	77.41	84.58	91.77	98.97
82.0	55.83	62.87	69.95	77.06	84.19	91.33	98.49
84.0	55.59	62.60	69.64	76.71	83.80	90.91	98.03
86.0	55.35	62.32	69.33	76.36	83.41	90.48	97.56
88.0	55.11	62.05	69.02	76.02	83.03	90.06	97.11
90.0	54.87	61.78	68.72	75.68	82.66	89.65	96.65
92.0	54.64	61.52	68.42	75.34	82.28	89.24	96.21
94.0	54.41	61.25	68.12	75.01	81.92	88.84	95.76
96.0	54.18	60.99	67.83	74.68	81.55	88.43	95.33
98.0	53.96	60.73	67.53	74.35	81.19	88.04	94.89
100.0	53.73	60.48	67.24	74.03	80.83	87.64	94.46
102.0	53.51	60.22	66.96	73.71	80.48	87.26	94.04
104.0	53.29	59.97	66.68	73.40	80.13	86.87	93.62
106.0	53.07	59.72	66.39	73.08	79.78	86.49	93.21
108.0	52.86	59.48	66.12	72.77	79.44	86.11	92.80
110.0	52.64	59.23	65.84	72.46	79.10	85.74	92.39
112.0	52.43	58.99	65.57	72.16	78.76	85.37	91.99
114.0	52.22	58.75	65.30	71.86	78.43	85.01	91.59
116.0	52.01	58.51	65.03	71.56	78.10	84.65	91.19
118.0	51.81	58.28	64.77	71.26	77.77	84.29	90.80
120.0	51.60	58.05	64.50	70.97	77.45	83.93	90.42
122.0	51.40	57.81	64.24	70.68	77.13	83.58	90.04
124.0	51.20	57.59	63.98	70.39	76.81	83.23	89.66
126.0	51.00	57.36	63.73	70.11	76.50	82.89	89.28
128.0	50.80	57.13	63.48	69.83	76.19	82.55	88.91
130.0	50.61	56.91	63.23	69.55	75.88	82.21	88.54

Table 11-1. Oxygen Contents Table (SCF/cu ft) - Continued

°F	1500 psig	1600 psig	1700 psig	1800 psig	1900 psig	2000 psig	2100 psig
-40.0	155.7	167.5	179.4	191.3	203.2	215.1	226.9
-38.0	154.3	166.0	177.7	189.5	201.3	213.0	224.7
-36.0	153.0	164.5	176.1	187.8	199.4	211.0	222.6
-34.0	151.7	163.1	174.6	186.1	197.6	209.0	220.5
-32.0	150.5	161.7	173.1	184.4	195.8	207.1	218.4
-30.0	149.2	160.4	171.6	182.8	194.0	205.2	216.4
-28.0	148.0	159.0	170.1	181.2	192.3	203.4	214.4
-26.0	146.9	157.7	168.7	179.7	190.7	201.6	212.5
-24.0	145.7	156.5	167.3	178.2	189.0	199.9	210.7
-22.0	144.6	155.2	165.9	176.7	187.4	198.1	208.8
-20.0	143.5	154.0	164.6	175.2	185.9	196.5	207.0
-18.0	142.4	152.8	163.3	173.8	184.3	194.8	205.3
-16.0	141.3	151.6	162.0	172.4	182.8	193.2	203.6
-14.0	140.3	150.5	160.8	171.1	181.4	191.7	201.9
-12.0	139.2	149.4	159.5	169.7	179.9	190.1	200.3
-10.0	138.2	148.3	158.3	168.4	178.5	188.6	198.7
-8.0	137.2	147.2	157.2	167.2	177.2	187.2	197.1
-6.0	136.3	146.1	156.0	165.9	175.8	185.7	195.6
-4.0	135.3	145.1	154.9	164.7	174.5	184.3	194.1
-2.0	134.4	144.1	153.8	163.5	173.2	182.9	192.6
0.0	133.5	143.1	152.7	162.3	171.9	181.6	191.1
2.0	132.6	142.1	151.6	161.1	170.7	180.2	189.7
4.0	131.7	141.1	150.5	160.0	169.5	178.9	188.3
6.0	130.8	140.1	149.5	158.9	168.3	177.6	187.0
8.0	129.9	139.2	148.5	157.8	167.1	176.4	185.6
10.0	129.1	138.3	147.5	156.7	165.9	175.1	184.3
12.0	128.3	137.4	146.5	155.6	164.8	173.9	183.0
14.0	127.5	136.5	145.5	154.6	163.7	172.7	181.7
16.0	126.7	135.6	144.6	153.6	162.6	171.5	180.5
18.0	125.9	134.8	143.7	152.6	161.5	170.4	179.2
20.0	125.1	133.9	142.7	151.6	160.4	169.2	178.0
22.0	124.3	133.1	141.8	150.6	159.4	168.1	176.9
24.0	123.6	132.2	140.9	149.6	158.3	167.0	175.7
26.0	122.8	131.4	140.1	148.7	157.3	166.0	174.5
28.0	122.1	130.6	139.2	147.8	156.3	164.9	173.4
30.0	121.4	129.9	138.4	146.9	155.4	163.8	172.3
32.0	120.7	129.1	137.5	146.0	154.4	162.8	171.2
34.0	120.0	128.3	136.7	145.1	153.4	161.8	170.1
36.0	119.3	127.6	135.9	144.2	152.5	160.8	169.1
38.0	118.6	126.8	135.1	143.3	151.6	159.8	168.0
40.0	117.9	126.1	134.3	142.5	150.7	158.9	167.0
42.0	117.2	125.4	133.5	141.7	149.8	157.9	166.0
44.0	116.6	124.7	132.8	140.8	148.9	157.0	165.0
46.0	115.9	124.0	132.0	140.0	148.0	156.0	164.0

Table 11-1. Oxygen Contents Table (SCF/cu ft) - Continued

°F	1500 psig	1600 psig	1700 psig	1800 psig	1900 psig	2000 psig	2100 psig
48.0	115.3	123.3	131.3	139.2	147.2	155.1	163.1
50.0	114.7	122.6	130.5	138.4	146.3	154.2	162.1
52.0	114.1	121.9	129.8	137.7	145.5	153.4	161.2
54.0	113.5	121.3	129.1	136.9	144.7	152.5	160.2
56.0	112.9	120.6	128.4	136.1	143.9	151.6	159.3
58.0	112.3	120.0	127.7	135.4	143.1	150.8	158.4
60.0	111.7	119.3	127.0	134.7	142.3	149.9	157.5
62.0	111.1	118.7	126.3	133.9	141.5	149.1	156.7
64.0	110.5	118.1	125.6	133.2	140.8	148.3	155.8
66.0	109.9	117.5	125.0	132.5	140.0	147.5	155.0
68.0	109.4	116.9	124.3	131.8	139.3	146.7	154.1
70.0	108.8	116.3	123.7	131.1	138.5	145.9	153.3
72.0	108.3	115.7	123.1	130.4	137.8	145.1	152.5
74.0	107.8	115.1	122.4	129.8	137.1	144.4	151.7
76.0	107.2	114.5	121.8	129.1	136.4	143.6	150.9
78.0	106.7	113.9	121.2	128.4	135.7	142.9	150.1
80.0	106.2	113.4	120.6	127.8	135.0	142.2	149.3
82.0	105.7	112.8	120.0	127.2	134.3	141.4	148.5
84.0	105.2	112.3	119.4	126.5	133.6	140.7	147.8
86.0	104.6	111.7	118.8	125.9	133.0	140.0	147.0
88.0	104.2	111.2	118.2	125.3	132.3	139.3	146.3
90.0	103.7	110.7	117.7	124.7	131.7	138.6	145.6
92.0	103.2	110.1	117.1	124.1	131.0	137.9	144.8
94.0	102.7	109.6	116.6	123.5	130.4	137.3	144.1
96.0	102.2	109.1	116.0	122.9	129.7	136.6	143.4
98.0	101.8	108.6	115.5	122.3	129.1	135.9	142.7
100.0	101.3	108.1	114.9	121.7	128.5	135.3	142.0
102.0	100.8	107.6	114.4	121.2	127.9	134.6	141.4
104.0	100.4	107.1	113.9	120.6	127.3	134.0	140.7
106.0	99.92	106.6	113.3	120.0	126.7	133.4	140.0
108.0	99.48	106.2	112.8	119.5	126.1	132.8	139.4
110.0	99.04	105.7	112.3	118.9	125.6	132.1	138.7
112.0	98.60	105.2	111.8	118.4	125.0	131.5	138.1
114.0	98.17	104.7	111.3	117.9	124.4	130.9	137.4
116.0	97.74	104.3	110.8	117.3	123.9	130.3	136.8
118.0	97.32	103.8	110.3	116.8	123.3	129.8	136.2
120.0	96.90	103.4	109.8	116.3	122.7	129.2	135.6
122.0	96.49	102.9	109.4	115.8	122.2	128.6	135.0
124.0	96.08	102.5	108.9	115.3	121.7	128.0	134.4
126.0	95.67	102.1	108.4	114.8	121.1	127.5	133.8
128.0	95.27	101.6	108.0	114.3	120.6	126.9	133.2
130.0	94.87	101.2	107.5	113.8	120.1	126.4	132.6

Table 11-1. Oxygen Contents Table (SCF/cu ft) - Continued

°F	2200 psig	2300 psig	2400 psig	2500 psig	2600 psig	2700 psig	2800 psig
-40.0	238.6	250.2	261.6	272.7	283.6	294.2	304.6
-38.0	236.3	247.7	259.0	270.0	280.8	291.4	301.6
-36.0	234.0	245.3	256.4	267.4	278.1	288.6	298.8
-34.0	231.8	243.0	254.0	264.8	275.4	285.8	295.9
-32.0	229.6	240.7	251.6	262.3	272.8	283.1	293.2
-30.0	227.5	238.4	249.2	259.8	270.3	280.5	290.5
-28.0	225.4	236.2	246.9	257.4	267.8	277.9	287.8
-26.0	223.4	234.1	244.7	255.1	265.4	275.4	285.2
-24.0	221.4	232.0	242.5	252.8	263.0	272.9	282.7
-22.0	219.4	229.9	240.3	250.6	260.6	270.5	280.2
-20.0	217.5	227.9	238.2	248.4	258.4	268.2	277.8
-18.0	215.7	226.0	236.2	246.2	256.1	265.9	275.4
-16.0	213.9	224.1	234.2	244.1	253.9	263.6	273.1
-14.0	212.1	222.2	232.2	242.1	251.8	261.4	270.8
-12.0	210.4	220.4	230.3	240.1	249.7	259.2	268.5
-10.0	208.7	218.6	228.4	238.1	247.7	257.1	266.3
-8.0	207.0	216.8	226.5	236.2	245.6	255.0	264.2
-6.0	205.4	215.1	224.7	234.3	243.7	252.9	262.0
-4.0	203.8	213.4	223.0	232.4	241.7	250.9	260.0
-2.0	202.2	211.8	221.2	230.6	239.8	249.0	257.9
0.0	200.7	210.1	219.5	228.8	238.0	247.0	255.9
2.0	199.2	208.5	217.9	227.1	236.2	245.1	254.0
4.0	197.7	207.0	216.2	225.3	234.4	243.3	252.1
6.0	196.2	205.5	214.6	223.7	232.6	241.4	250.2
8.0	194.8	204.0	213.0	222.0	230.9	239.7	248.3
10.0	193.4	202.5	211.5	220.4	229.2	237.9	246.5
12.0	192.0	201.0	210.0	218.8	227.5	236.2	244.7
14.0	190.7	199.6	208.5	217.2	225.9	234.5	242.9
16.0	189.4	198.2	207.0	215.7	224.3	232.8	241.2
18.0	188.1	196.8	205.6	214.2	222.7	231.2	239.5
20.0	186.8	195.5	204.1	212.7	221.2	229.6	237.8
22.0	185.5	194.2	202.7	211.2	219.7	228.0	236.2
24.0	184.3	192.9	201.4	209.8	218.2	226.4	234.6
26.0	183.1	191.6	200.0	208.4	216.7	224.9	233.0
28.0	181.9	190.3	198.7	207.0	215.2	223.4	231.4
30.0	180.7	189.1	197.4	205.7	213.8	221.9	229.9
32.0	179.6	187.9	196.1	204.3	212.4	220.5	228.4
34.0	178.4	186.7	194.9	203.0	211.1	219.0	226.9
36.0	177.3	185.5	193.6	201.7	209.7	217.6	225.5
38.0	176.2	184.3	192.4	200.4	208.4	216.2	224.0
40.0	175.1	183.2	191.2	199.2	207.1	214.9	222.6
42.0	174.1	182.1	190.0	197.9	205.8	213.5	221.2
44.0	173.0	181.0	188.9	196.7	204.5	212.2	219.8
46.0	172.0	179.9	187.7	195.5	203.2	210.9	218.5

Table 11-1. Oxygen Contents Table (SCF/cu ft) - Continued

°F	2200 psig	2300 psig	2400 psig	2500 psig	2600 psig	2700 psig	2800 psig
48.0	170.9	178.8	186.6	194.3	202.0	209.6	217.1
50.0	169.9	177.7	185.5	193.2	200.8	208.3	215.8
52.0	168.9	176.7	184.4	192.0	199.6	207.1	214.5
54.0	168.0	175.7	183.3	190.9	198.4	205.9	213.3
56.0	167.0	174.6	182.2	189.8	197.2	204.7	212.0
58.0	166.1	173.6	181.2	188.7	196.1	203.5	210.8
60.0	165.1	172.7	180.1	187.6	195.0	202.3	209.5
62.0	164.2	171.7	179.1	186.5	193.9	201.1	208.3
64.0	163.3	170.7	178.1	185.5	192.8	200.0	207.1
66.0	162.4	169.8	177.1	184.4	191.7	198.9	206.0
68.0	161.5	168.8	176.1	183.4	190.6	197.7	204.8
70.0	160.6	167.9	175.2	182.4	189.5	196.6	203.7
72.0	159.8	167.0	174.2	181.4	188.5	195.6	202.6
74.0	158.9	166.1	173.3	180.4	187.5	194.5	201.4
76.0	158.1	165.2	172.4	179.4	186.5	193.4	200.4
78.0	157.2	164.4	171.4	178.5	185.5	192.4	199.3
80.0	156.4	163.5	170.5	177.5	184.5	191.4	198.2
82.0	155.6	162.6	169.6	176.6	183.5	190.4	197.2
84.0	154.8	161.8	168.8	175.7	182.5	189.4	196.1
86.0	154.0	161.0	167.9	174.8	181.6	188.4	195.1
88.0	153.2	160.2	167.0	173.9	180.7	187.4	194.1
90.0	152.5	159.3	166.2	173.0	179.7	186.4	193.1
92.0	151.7	158.5	165.3	172.1	178.8	185.5	192.1
94.0	151.0	157.8	164.5	171.2	177.9	184.5	191.1
96.0	150.2	157.0	163.7	170.4	177.0	183.6	190.2
98.0	149.5	156.2	162.9	169.5	176.1	182.7	189.2
100.0	148.8	155.4	162.1	168.7	175.3	181.8	188.3
102.0	148.0	154.7	161.3	167.9	174.4	180.9	187.3
104.0	147.3	153.9	160.5	167.1	173.6	180.0	186.4
106.0	146.6	153.2	159.8	166.3	172.7	179.1	185.5
108.0	145.9	152.5	159.0	165.5	171.9	178.3	184.6
110.0	145.3	151.8	158.2	164.7	171.1	177.4	183.7
112.0	144.6	151.0	157.5	163.9	170.3	176.6	182.8
114.0	143.9	150.3	156.8	163.1	169.5	175.7	182.0
116.0	143.2	149.7	156.0	162.4	168.7	174.9	181.1
118.0	142.6	149.0	155.3	161.6	167.9	174.1	180.3
120.0	141.9	148.3	154.6	160.9	167.1	173.3	179.4
122.0	141.3	147.6	153.9	160.1	166.3	172.5	178.6
124.0	140.7	146.9	153.2	159.4	165.6	171.7	177.8
126.0	140.0	146.3	152.5	158.7	164.8	170.9	177.0
128.0	139.4	145.6	151.8	158.0	164.1	170.2	176.2
130.0	138.8	145.0	151.1	157.3	163.3	169.4	175.4

Table 11-1. Oxygen Contents Table (SCF/cu ft) - Continued

°F	2900 psig	3000 psig	3100 psig	3200 psig	3300 psig	3400 psig	3500 psig
-40.0	314.7	324.4	333.8	343.0	351.8	360.4	368.6
-38.0	311.6	321.3	330.7	339.8	348.7	357.2	365.4
-36.0	308.7	318.3	327.7	336.8	345.6	354.1	362.3
-34.0	305.8	315.4	324.7	333.7	342.5	351.0	359.2
-32.0	303.0	312.5	321.8	330.8	339.5	348.0	356.1
-30.0	300.2	309.7	318.9	327.9	336.6	345.0	353.1
-28.0	297.5	306.9	316.1	325.0	333.7	342.1	350.2
-26.0	294.8	304.2	313.3	322.2	330.8	339.2	347.3
-24.0	292.2	301.5	310.6	319.4	328.0	336.4	344.5
-22.0	289.7	298.9	308.0	316.7	325.3	333.6	341.7
-20.0	287.2	296.4	305.3	314.1	322.6	330.9	338.9
-18.0	284.7	293.9	302.8	311.5	319.9	328.2	336.2
-16.0	282.3	291.4	300.3	308.9	317.3	325.5	333.5
-14.0	280.0	289.0	297.8	306.4	314.8	323.0	330.9
-12.0	277.7	286.6	295.4	303.9	312.3	320.4	328.3
-10.0	275.4	284.3	293.0	301.5	309.8	317.9	325.8
-8.0	273.2	282.0	290.7	299.1	307.4	315.4	323.3
-6.0	271.0	279.8	288.4	296.8	305.0	313.0	320.8
-4.0	268.9	277.6	286.1	294.5	302.6	310.6	318.4
-2.0	266.8	275.4	283.9	292.2	300.3	308.3	316.1
0.0	264.7	273.3	281.7	290.0	298.1	306.0	313.7
2.0	262.7	271.2	279.6	287.8	295.9	303.7	311.4
4.0	260.7	269.2	277.5	285.7	293.7	301.5	309.2
6.0	258.7	267.2	275.4	283.6	291.5	299.3	306.9
8.0	256.8	265.2	273.4	281.5	289.4	297.1	304.7
10.0	254.9	263.3	271.4	279.4	287.3	295.0	302.6
12.0	253.1	261.4	269.5	277.4	285.3	292.9	300.5
14.0	251.3	259.5	267.5	275.5	283.3	290.9	298.4
16.0	249.5	257.6	265.7	273.5	281.3	288.9	296.3
18.0	247.7	255.8	263.8	271.6	279.3	286.9	294.3
20.0	246.0	254.1	262.0	269.8	277.4	284.9	292.3
22.0	244.3	252.3	260.2	267.9	275.5	283.0	290.3
24.0	242.6	250.6	258.4	266.1	273.7	281.1	288.4
26.0	241.0	248.9	256.7	264.3	271.8	279.2	286.5
28.0	239.4	247.2	255.0	262.6	270.0	277.4	284.6
30.0	237.8	245.6	253.3	260.8	268.3	275.6	282.8
32.0	236.2	244.0	251.6	259.1	266.5	273.8	280.9
34.0	234.7	242.4	250.0	257.4	264.8	272.0	279.1
36.0	233.2	240.8	248.4	255.8	263.1	270.3	277.4
38.0	231.7	239.3	246.8	254.2	261.4	268.6	275.6
40.0	230.2	237.8	245.2	252.6	259.8	266.9	273.9
42.0	228.8	236.3	243.7	251.0	258.2	265.3	272.2
44.0	227.4	234.8	242.2	249.4	256.6	263.6	270.6
46.0	226.0	233.4	240.7	247.9	255.0	262.0	268.9

Table 11-1. Oxygen Contents Table (SCF/cu ft) - Continued

°F	2900 psig	3000 psig	3100 psig	3200 psig	3300 psig	3400 psig	3500 psig
48.0	224.6	231.9	239.2	246.4	253.5	260.4	267.3
50.0	223.2	230.5	237.8	244.9	251.9	258.9	265.7
52.0	221.9	229.2	236.3	243.4	250.4	257.3	264.1
54.0	220.6	227.8	234.9	242.0	248.9	255.8	262.6
56.0	219.3	226.5	233.6	240.6	247.5	254.3	261.0
58.0	218.0	225.1	232.2	239.2	246.0	252.8	259.5
60.0	216.7	223.8	230.8	237.8	244.6	251.4	258.0
62.0	215.5	222.5	229.5	236.4	243.2	249.9	256.5
64.0	214.2	221.3	228.2	235.1	241.8	248.5	255.1
66.0	213.0	220.0	226.9	233.7	240.5	247.1	253.7
68.0	211.8	218.8	225.6	232.4	239.1	245.7	252.2
70.0	210.7	217.6	224.4	231.1	237.8	244.4	250.8
72.0	209.5	216.3	223.1	229.8	236.5	243.0	249.5
74.0	208.3	215.2	221.9	228.6	235.2	241.7	248.1
76.0	207.2	214.0	220.7	227.3	233.9	240.4	246.8
78.0	206.1	212.8	219.5	226.1	232.6	239.1	245.4
80.0	205.0	211.7	218.3	224.9	231.4	237.8	244.1
82.0	203.9	210.6	217.2	223.7	230.2	236.5	242.8
84.0	202.8	209.5	216.0	222.5	228.9	235.3	241.6
86.0	201.8	208.4	214.9	221.4	227.7	234.1	240.3
88.0	200.7	207.3	213.8	220.2	226.6	232.8	239.1
90.0	199.7	206.2	212.7	219.1	225.4	231.6	237.8
92.0	198.6	205.1	211.6	217.9	224.2	230.5	236.6
94.0	197.6	204.1	210.5	216.8	223.1	229.3	235.4
96.0	196.6	203.1	209.4	215.7	222.0	228.1	234.2
98.0	195.7	202.0	208.4	214.6	220.9	227.0	233.1
100.0	194.7	201.0	207.3	213.6	219.8	225.9	231.9
102.0	193.7	200.0	206.3	212.5	218.7	224.7	230.7
104.0	192.8	199.1	205.3	211.5	217.6	223.6	229.6
106.0	191.8	198.1	204.3	210.4	216.5	222.5	228.5
108.0	190.9	197.1	203.3	209.4	215.5	221.5	227.4
110.0	190.0	196.2	202.3	208.4	214.4	220.4	226.3
112.0	189.1	195.2	201.4	207.4	213.4	219.3	225.2
114.0	188.2	194.3	200.4	206.4	212.4	218.3	224.1
116.0	187.3	193.4	199.4	205.4	211.4	217.3	223.1
118.0	186.4	192.5	198.5	204.5	210.4	216.3	222.0
120.0	185.5	191.6	197.6	203.5	209.4	215.2	221.0
122.0	184.7	190.7	196.7	202.6	208.4	214.2	220.0
124.0	183.8	189.8	195.8	201.7	207.5	213.3	219.0
126.0	183.0	189.0	194.9	200.7	206.5	212.3	218.0
128.0	182.2	188.1	194.0	199.8	205.6	211.3	217.0
130.0	181.3	187.3	193.1	198.9	204.7	210.4	216.0

Table 11-1. Oxygen Contents Table (SCF/cu ft) - Continued

°F	3600 psig	3700 psig	3800 psig	3900 psig	4000 psig	4100 psig	4200 psig
-40.0	376.6	384.3	391.7	398.9	405.8	412.5	419.0
-38.0	373.4	381.1	388.5	395.7	402.6	409.3	415.8
-36.0	370.2	377.9	385.3	392.5	399.5	406.2	412.7
-34.0	367.1	374.8	382.2	389.4	396.4	403.1	409.6
-32.0	364.1	371.7	379.2	386.4	393.3	400.1	406.6
-30.0	361.1	368.7	376.1	383.3	390.3	397.0	403.6
-28.0	358.1	365.8	373.2	380.4	387.3	394.1	400.6
-26.0	355.2	362.8	370.2	377.4	384.4	391.1	397.7
-24.0	352.3	359.9	367.3	374.5	381.5	388.2	394.8
-22.0	349.5	357.1	364.5	371.7	378.6	385.4	391.9
-20.0	346.7	354.3	361.7	368.8	375.8	382.5	389.1
-18.0	344.0	351.6	358.9	366.1	373.0	379.8	386.3
-16.0	341.3	348.9	356.2	363.3	370.3	377.0	383.6
-14.0	338.7	346.2	353.5	360.6	367.6	374.3	380.8
-12.0	336.0	343.6	350.9	358.0	364.9	371.6	378.2
-10.0	333.5	341.0	348.3	355.4	362.3	369.0	375.5
-8.0	331.0	338.4	345.7	352.8	359.7	366.4	372.9
-6.0	328.5	335.9	343.2	350.2	357.1	363.8	370.3
-4.0	326.0	333.4	340.7	347.7	354.6	361.3	367.8
-2.0	323.6	331.0	338.2	345.3	352.1	358.8	365.3
0.0	321.3	328.6	335.8	342.8	349.6	356.3	362.8
2.0	318.9	326.3	333.4	340.4	347.2	353.9	360.4
4.0	316.6	323.9	331.1	338.0	344.8	351.5	357.9
6.0	314.4	321.7	328.8	335.7	342.5	349.1	355.6
8.0	312.1	319.4	326.5	333.4	340.2	346.8	353.2
10.0	310.0	317.2	324.2	331.1	337.9	344.5	350.9
12.0	307.8	315.0	322.0	328.9	335.6	342.2	348.6
14.0	305.7	312.8	319.9	326.7	333.4	339.9	346.3
16.0	303.6	310.7	317.7	324.5	331.2	337.7	344.1
18.0	301.5	308.6	315.6	322.4	329.0	335.6	341.9
20.0	299.5	306.6	313.5	320.3	326.9	333.4	339.8
22.0	297.5	304.5	311.4	318.2	324.8	331.3	337.6
24.0	295.5	302.5	309.4	316.1	322.7	329.2	335.5
26.0	293.6	300.6	307.4	314.1	320.7	327.1	333.4
28.0	291.7	298.6	305.5	312.1	318.7	325.1	331.4
30.0	289.8	296.7	303.5	310.2	316.7	323.1	329.3
32.0	287.9	294.8	301.6	308.2	314.7	321.1	327.3
34.0	286.1	293.0	299.7	306.3	312.8	319.1	325.3
36.0	284.3	291.1	297.8	304.4	310.9	317.2	323.4
38.0	282.5	289.3	296.0	302.6	309.0	315.3	321.5
40.0	280.8	287.6	294.2	300.7	307.1	313.4	319.6
42.0	279.1	285.8	292.4	298.9	305.3	311.5	317.7
44.0	277.4	284.1	290.7	297.1	303.5	309.7	315.8
46.0	275.7	282.4	288.9	295.4	301.7	307.9	314.0

Table 11-1. Oxygen Contents Table (SCF/cu ft) - Continued

°F	3600 psig	3700 psig	3800 psig	3900 psig	4000 psig	4100 psig	4200 psig
48.0	274.0	280.7	287.2	293.6	299.9	306.1	312.2
50.0	272.4	279.0	285.5	291.9	298.2	304.3	310.4
52.0	270.8	277.4	283.8	290.2	296.5	302.6	308.6
54.0	269.2	275.8	282.2	288.5	294.8	300.9	306.9
56.0	267.6	274.2	280.6	286.9	293.1	299.2	305.2
58.0	266.1	272.6	279.0	285.3	291.4	297.5	303.5
60.0	264.6	271.0	277.4	283.6	289.8	295.8	301.8
62.0	263.1	269.5	275.8	282.1	288.2	294.2	300.1
64.0	261.6	268.0	274.3	280.5	286.6	292.6	298.5
66.0	260.1	266.5	272.8	278.9	285.0	291.0	296.9
68.0	258.7	265.0	271.3	277.4	283.5	289.4	295.3
70.0	257.2	263.6	269.8	275.9	281.9	287.9	293.7
72.0	255.8	262.1	268.3	274.4	280.4	286.3	292.1
74.0	254.5	260.7	266.9	272.9	278.9	284.8	290.6
76.0	253.1	259.3	265.4	271.5	277.4	283.3	289.1
78.0	251.7	257.9	264.0	270.0	276.0	281.8	287.6
80.0	250.4	256.5	262.6	268.6	274.5	280.4	286.1
82.0	249.1	255.2	261.3	267.2	273.1	278.9	284.6
84.0	247.8	253.9	259.9	265.8	271.7	277.5	283.2
86.0	246.5	252.5	258.6	264.5	270.3	276.1	281.7
88.0	245.2	251.2	257.2	263.1	268.9	274.7	280.3
90.0	243.9	250.0	255.9	261.8	267.6	273.3	278.9
92.0	242.7	248.7	254.6	260.5	266.2	271.9	277.5
94.0	241.5	247.4	253.3	259.2	264.9	270.6	276.1
96.0	240.2	246.2	252.1	257.9	263.6	269.2	274.8
98.0	239.0	245.0	250.8	256.6	262.3	267.9	273.4
100.0	237.9	243.8	249.6	255.3	261.0	266.6	272.1
102.0	236.7	242.6	248.4	254.1	259.7	265.3	270.8
104.0	235.5	241.4	247.1	252.8	258.5	264.0	269.5
106.0	234.4	240.2	245.9	251.6	257.2	262.8	268.2
108.0	233.3	239.0	244.8	250.4	256.0	261.5	266.9
110.0	232.1	237.9	243.6	249.2	254.8	260.3	265.7
112.0	231.0	236.8	242.4	248.0	253.6	259.1	264.4
114.0	229.9	235.6	241.3	246.9	252.4	257.8	263.2
116.0	228.8	234.5	240.2	245.7	251.2	256.6	262.0
118.0	227.8	233.4	239.1	244.6	250.1	255.5	260.8
120.0	226.7	232.4	237.9	243.5	248.9	254.3	259.6
122.0	225.7	231.3	236.9	242.3	247.8	253.1	258.4
124.0	224.6	230.2	235.8	241.2	246.6	252.0	257.3
126.0	223.6	229.2	234.7	240.1	245.5	250.9	256.1
128.0	222.6	228.1	233.6	239.1	244.4	249.7	255.0
130.0	221.6	227.1	232.6	238.0	243.3	248.6	253.8

Table 11-1. Oxygen Contents Table (SCF/cu ft) - Continued

°F	4300 psig	4400 psig	4500 psig	4600 psig	4700 psig	4800 psig	4900 psig
-40.0	425.3	431.3	437.2	442.9	448.4	453.8	459.0
-38.0	422.1	428.2	434.1	439.8	445.4	450.8	456.0
-36.0	419.0	425.1	431.0	436.8	442.3	447.7	453.0
-34.0	415.9	422.1	428.0	433.8	439.3	444.8	450.0
-32.0	412.9	419.0	425.0	430.8	436.4	441.8	447.1
-30.0	409.9	416.1	422.0	427.8	433.4	438.9	444.2
-28.0	407.0	413.1	419.1	424.9	430.5	436.0	441.3
-26.0	404.0	410.2	416.2	422.0	427.6	433.1	438.4
-24.0	401.1	407.3	413.3	419.1	424.8	430.3	435.6
-22.0	398.3	404.5	410.5	416.3	422.0	427.5	432.8
-20.0	395.5	401.6	407.6	413.5	419.2	424.7	430.1
-18.0	392.7	398.9	404.9	410.7	416.4	421.9	427.3
-16.0	389.9	396.1	402.1	408.0	413.7	419.2	424.6
-14.0	387.2	393.4	399.4	405.3	411.0	416.5	421.9
-12.0	384.5	390.7	396.7	402.6	408.3	413.8	419.3
-10.0	381.9	388.1	394.1	399.9	405.7	411.2	416.6
-8.0	379.3	385.4	391.5	397.3	403.0	408.6	414.0
-6.0	376.7	382.9	388.9	394.7	400.5	406.0	411.4
-4.0	374.1	380.3	386.3	392.2	397.9	403.5	408.9
-2.0	371.6	377.8	383.8	389.7	395.4	400.9	406.4
0.0	369.1	375.3	381.3	387.2	392.9	398.4	403.9
2.0	366.7	372.8	378.8	384.7	390.4	396.0	401.4
4.0	364.2	370.4	376.4	382.3	388.0	393.5	399.0
6.0	361.9	368.0	374.0	379.8	385.6	391.1	396.6
8.0	359.5	365.6	371.6	377.5	383.2	388.7	394.2
10.0	357.2	363.3	369.3	375.1	380.8	386.4	391.8
12.0	354.9	361.0	367.0	372.8	378.5	384.0	389.5
14.0	352.6	358.7	364.7	370.5	376.2	381.7	387.2
16.0	350.4	356.4	362.4	368.2	373.9	379.5	384.9
18.0	348.1	354.2	360.2	366.0	371.7	377.2	382.6
20.0	346.0	352.0	358.0	363.8	369.4	375.0	380.4
22.0	343.8	349.9	355.8	361.6	367.2	372.8	378.2
24.0	341.7	347.7	353.6	359.4	365.1	370.6	376.0
26.0	339.6	345.6	351.5	357.3	362.9	368.4	373.8
28.0	337.5	343.5	349.4	355.2	360.8	366.3	371.7
30.0	335.4	341.4	347.3	353.1	358.7	364.2	369.6
32.0	333.4	339.4	345.3	351.0	356.6	362.1	367.5
34.0	331.4	337.4	343.2	349.0	354.6	360.1	365.4
36.0	329.5	335.4	341.2	347.0	352.5	358.0	363.4
38.0	327.5	333.4	339.3	345.0	350.5	356.0	361.4
40.0	325.6	331.5	337.3	343.0	348.6	354.0	359.4
42.0	323.7	329.6	335.4	341.1	346.6	352.1	357.4
44.0	321.8	327.7	333.5	339.1	344.7	350.1	355.5
46.0	320.0	325.8	331.6	337.2	342.8	348.2	353.5

Table 11-1. Oxygen Contents Table (SCF/cu ft) - Continued

°F	4300 psig	4400 psig	4500 psig	4600 psig	4700 psig	4800 psig	4900 psig
48.0	318.1	324.0	329.7	335.4	340.9	346.3	351.6
50.0	316.3	322.2	327.9	333.5	339.0	344.4	349.7
52.0	314.6	320.4	326.1	331.7	337.2	342.6	347.9
54.0	312.8	318.6	324.3	329.9	335.3	340.7	346.0
56.0	311.1	316.8	322.5	328.1	333.5	338.9	344.2
58.0	309.3	315.1	320.8	326.3	331.8	337.1	342.4
60.0	307.6	313.4	319.0	324.6	330.0	335.3	340.6
62.0	306.0	311.7	317.3	322.8	328.3	333.6	338.8
64.0	304.3	310.0	315.6	321.1	326.5	331.8	337.1
66.0	302.7	308.3	313.9	319.4	324.8	330.1	335.3
68.0	301.0	306.7	312.3	317.8	323.1	328.4	333.6
70.0	299.4	305.1	310.6	316.1	321.5	326.8	331.9
72.0	297.9	303.5	309.0	314.5	319.8	325.1	330.3
74.0	296.3	301.9	307.4	312.9	318.2	323.4	328.6
76.0	294.8	300.4	305.9	311.3	316.6	321.8	327.0
78.0	293.2	298.8	304.3	309.7	315.0	320.2	325.3
80.0	291.7	297.3	302.7	308.1	313.4	318.6	323.7
82.0	290.2	295.8	301.2	306.6	311.9	317.1	322.2
84.0	288.8	294.3	299.7	305.1	310.3	315.5	320.6
86.0	287.3	292.8	298.2	303.5	308.8	314.0	319.0
88.0	285.9	291.3	296.7	302.1	307.3	312.4	317.5
90.0	284.4	289.9	295.3	300.6	305.8	310.9	316.0
92.0	283.0	288.5	293.8	299.1	304.3	309.4	314.5
94.0	281.6	287.1	292.4	297.7	302.8	308.0	313.0
96.0	280.3	285.7	291.0	296.2	301.4	306.5	311.5
98.0	278.9	284.3	289.6	294.8	300.0	305.0	310.0
100.0	277.6	282.9	288.2	293.4	298.6	303.6	308.6
102.0	276.2	281.6	286.8	292.0	297.2	302.2	307.2
104.0	274.9	280.2	285.5	290.7	295.8	300.8	305.8
106.0	273.6	278.9	284.1	289.3	294.4	299.4	304.4
108.0	272.3	277.6	282.8	288.0	293.0	298.0	303.0
110.0	271.0	276.3	281.5	286.6	291.7	296.7	301.6
112.0	269.8	275.0	280.2	285.3	290.4	295.3	300.2
114.0	268.5	273.8	278.9	284.0	289.0	294.0	298.9
116.0	267.3	272.5	277.7	282.7	287.7	292.7	297.6
118.0	266.1	271.3	276.4	281.5	286.5	291.4	296.2
120.0	264.9	270.0	275.2	280.2	285.2	290.1	294.9
122.0	263.7	268.8	273.9	278.9	283.9	288.8	293.6
124.0	262.5	267.6	272.7	277.7	282.7	287.5	292.4
126.0	261.3	266.4	271.5	276.5	281.4	286.3	291.1
128.0	260.1	265.3	270.3	275.3	280.2	285.0	289.8
130.0	259.0	264.1	269.1	274.1	279.0	283.8	288.6

Table 11-1. Oxygen Contents Table (SCF/cu ft) - Continued

°F	5000 psig	5100 psig	5200 psig	5300 psig	5400 psig	5500 psig	5600 psig
-40.0	464.1	469.0	473.7	478.4	482.9	487.3	491.6
-38.0	461.1	466.0	470.8	475.5	480.0	484.4	488.8
-36.0	458.1	463.0	467.9	472.6	477.1	481.6	485.9
-34.0	455.1	460.1	465.0	469.7	474.3	478.7	483.1
-32.0	452.2	457.2	462.1	466.8	471.4	475.9	480.3
-30.0	449.3	454.3	459.2	464.0	468.6	473.1	477.5
-28.0	446.5	451.5	456.4	461.2	465.8	470.3	474.8
-26.0	443.6	448.7	453.6	458.4	463.0	467.6	472.0
-24.0	440.8	445.9	450.8	455.6	460.3	464.9	469.3
-22.0	438.0	443.1	448.1	452.9	457.6	462.2	466.6
-20.0	435.3	440.4	445.3	450.2	454.9	459.5	464.0
-18.0	432.6	437.7	442.6	447.5	452.2	456.8	461.3
-16.0	429.8	435.0	439.9	444.8	449.5	454.2	458.7
-14.0	427.2	432.3	437.3	442.2	446.9	451.6	456.1
-12.0	424.5	429.7	434.7	439.5	444.3	449.0	453.5
-10.0	421.9	427.0	432.1	437.0	441.7	446.4	450.9
-8.0	419.3	424.5	429.5	434.4	439.2	443.8	448.4
-6.0	416.7	421.9	426.9	431.8	436.6	441.3	445.9
-4.0	414.2	419.4	424.4	429.3	434.1	438.8	443.4
-2.0	411.7	416.8	421.9	426.8	431.6	436.3	440.9
0.0	409.2	414.4	419.4	424.3	429.2	433.9	438.5
2.0	406.7	411.9	417.0	421.9	426.7	431.4	436.0
4.0	404.3	409.5	414.5	419.5	424.3	429.0	433.6
6.0	401.9	407.1	412.1	417.1	421.9	426.6	431.3
8.0	399.5	404.7	409.7	414.7	419.5	424.3	428.9
10.0	397.1	402.3	407.4	412.3	417.2	421.9	426.5
12.0	394.8	400.0	405.0	410.0	414.9	419.6	424.2
14.0	392.5	397.7	402.7	407.7	412.5	417.3	421.9
16.0	390.2	395.4	400.5	405.4	410.3	415.0	419.7
18.0	387.9	393.1	398.2	403.2	408.0	412.8	417.4
20.0	385.7	390.9	396.0	400.9	405.8	410.5	415.2
22.0	383.5	388.7	393.7	398.7	403.6	408.3	413.0
24.0	381.3	386.5	391.5	396.5	401.4	406.1	410.8
26.0	379.1	384.3	389.4	394.3	399.2	403.9	408.6
28.0	377.0	382.2	387.2	392.2	397.0	401.8	406.5
30.0	374.9	380.0	385.1	390.1	394.9	399.7	404.3
32.0	372.8	377.9	383.0	388.0	392.8	397.6	402.2
34.0	370.7	375.9	380.9	385.9	390.7	395.5	400.1
36.0	368.7	373.8	378.9	383.8	388.7	393.4	398.1
38.0	366.6	371.8	376.8	381.8	386.6	391.4	396.0
40.0	364.6	369.8	374.8	379.7	384.6	389.3	394.0
42.0	362.6	367.8	372.8	377.7	382.6	387.3	392.0
44.0	360.7	365.8	370.8	375.8	380.6	385.3	390.0
46.0	358.7	363.9	368.9	373.8	378.6	383.4	388.0

Table 11-1. Oxygen Contents Table (SCF/cu ft) - Continued

°F	5000 psig	5100 psig	5200 psig	5300 psig	5400 psig	5500 psig	5600 psig
48.0	356.8	361.9	366.9	371.9	376.7	381.4	386.1
50.0	354.9	360.0	365.0	369.9	374.8	379.5	384.1
52.0	353.0	358.1	363.1	368.0	372.9	377.6	382.2
54.0	351.2	356.3	361.3	366.2	371.0	375.7	380.3
56.0	349.4	354.4	359.4	364.3	369.1	373.8	378.5
58.0	347.5	352.6	357.6	362.5	367.3	372.0	376.6
60.0	345.7	350.8	355.8	360.6	365.4	370.1	374.8
62.0	344.0	349.0	354.0	358.8	363.6	368.3	372.9
64.0	342.2	347.2	352.2	357.1	361.8	366.5	371.1
66.0	340.5	345.5	350.4	355.3	360.1	364.7	369.3
68.0	338.7	343.8	348.7	353.5	358.3	363.0	367.6
70.0	337.0	342.0	347.0	351.8	356.6	361.2	365.8
72.0	335.3	340.3	345.3	350.1	354.8	359.5	364.1
74.0	333.7	338.7	343.6	348.4	353.1	357.8	362.4
76.0	332.0	337.0	341.9	346.7	351.4	356.1	360.7
78.0	330.4	335.4	340.2	345.0	349.8	354.4	359.0
80.0	328.8	333.7	338.6	343.4	348.1	352.7	357.3
82.0	327.2	332.1	337.0	341.8	346.5	351.1	355.6
84.0	325.6	330.5	335.4	340.2	344.8	349.5	354.0
86.0	324.0	329.0	333.8	338.6	343.2	347.8	352.4
88.0	322.5	327.4	332.2	337.0	341.6	346.2	350.8
90.0	320.9	325.8	330.7	335.4	340.1	344.7	349.2
92.0	319.4	324.3	329.1	333.9	338.5	343.1	347.6
94.0	317.9	322.8	327.6	332.3	337.0	341.5	346.0
96.0	316.4	321.3	326.1	330.8	335.4	340.0	344.5
98.0	315.0	319.8	324.6	329.3	333.9	338.5	343.0
100.0	313.5	318.3	323.1	327.8	332.4	337.0	341.4
102.0	312.1	316.9	321.6	326.3	330.9	335.5	339.9
104.0	310.6	315.4	320.2	324.9	329.5	334.0	338.4
106.0	309.2	314.0	318.7	323.4	328.0	332.5	337.0
108.0	307.8	312.6	317.3	322.0	326.5	331.1	335.5
110.0	306.4	311.2	315.9	320.5	325.1	329.6	334.1
112.0	305.1	309.8	314.5	319.1	323.7	328.2	332.6
114.0	303.7	308.5	313.1	317.7	322.3	326.8	331.2
116.0	302.4	307.1	311.8	316.4	320.9	325.4	329.8
118.0	301.0	305.7	310.4	315.0	319.5	324.0	328.4
120.0	299.7	304.4	309.1	313.6	318.2	322.6	327.0
122.0	298.4	303.1	307.7	312.3	316.8	321.2	325.6
124.0	297.1	301.8	306.4	311.0	315.5	319.9	324.3
126.0	295.8	300.5	305.1	309.6	314.1	318.6	322.9
128.0	294.6	299.2	303.8	308.3	312.8	317.2	321.6
130.0	293.3	297.9	302.5	307.0	311.5	315.9	320.3

Table 11-1. Oxygen Contents Table (SCF/cu ft) - Continued

°F	5700 psig	5800 psig	5900 psig	6000 psig
-40.0	495.8	499.9	503.9	507.8
-38.0	493.0	497.1	501.1	505.0
-36.0	490.2	494.3	498.3	502.3
-34.0	487.4	491.5	495.6	499.5
-32.0	484.6	488.8	492.8	496.8
-30.0	481.8	486.0	490.1	494.1
-28.0	479.1	483.3	487.4	491.4
-26.0	476.4	480.6	484.7	488.8
-24.0	473.7	477.9	482.1	486.1
-22.0	471.0	475.3	479.4	483.5
-20.0	468.3	472.6	476.8	480.9
-18.0	465.7	470.0	474.2	478.3
-16.0	463.1	467.4	471.6	475.7
-14.0	460.5	464.8	469.0	473.2
-12.0	457.9	462.3	466.5	470.6
-10.0	455.4	459.7	464.0	468.1
-8.0	452.9	457.2	461.5	465.6
-6.0	450.3	454.7	459.0	463.2
-4.0	447.9	452.2	456.5	460.7
-2.0	445.4	449.8	454.1	458.3
0.0	443.0	447.4	451.7	455.9
2.0	440.5	444.9	449.3	453.5
4.0	438.1	442.6	446.9	451.1
6.0	435.8	440.2	444.5	448.8
8.0	433.4	437.8	442.2	446.4
10.0	431.1	435.5	439.9	444.1
12.0	428.8	433.2	437.6	441.8
14.0	426.5	430.9	435.3	439.5
16.0	424.2	428.7	433.0	437.3
18.0	422.0	426.4	430.8	435.1
20.0	419.7	424.2	428.6	432.8
22.0	417.5	422.0	426.4	430.6
24.0	415.3	419.8	424.2	428.5
26.0	413.2	417.6	422.0	426.3
28.0	411.0	415.5	419.9	424.2
30.0	408.9	413.4	417.7	422.0
32.0	406.8	411.3	415.6	419.9
34.0	404.7	409.2	413.6	417.9
36.0	402.6	407.1	411.5	415.8
38.0	400.6	405.1	409.4	413.7
40.0	398.5	403.0	407.4	411.7
42.0	396.5	401.0	405.4	409.7
44.0	394.5	399.0	403.4	407.7
46.0	392.6	397.0	401.4	405.7

Table 11-1. Oxygen Contents Table (SCF/cu ft) - Continued

°F	5700 psig	5800 psig	5900 psig	6000 psig
48.0	390.6	395.1	399.5	403.8
50.0	388.7	393.2	397.5	401.9
52.0	386.8	391.2	395.6	399.9
54.0	384.9	389.3	393.7	398.0
56.0	383.0	387.5	391.8	396.1
58.0	381.1	385.6	390.0	394.3
60.0	379.3	383.7	388.1	392.4
62.0	377.5	381.9	386.3	390.6
64.0	375.7	380.1	384.5	388.8
66.0	373.9	378.3	382.7	387.0
68.0	372.1	376.5	380.9	385.2
70.0	370.3	374.8	379.1	383.4
72.0	368.6	373.0	377.4	381.7
74.0	366.9	371.3	375.6	379.9
76.0	365.2	369.6	373.9	378.2
78.0	363.5	367.9	372.2	376.5
80.0	361.8	366.2	370.5	374.8
82.0	360.1	364.5	368.9	373.1
84.0	358.5	362.9	367.2	371.5
86.0	356.8	361.2	365.6	369.8
88.0	355.2	359.6	363.9	368.2
90.0	353.6	358.0	362.3	366.6
92.0	352.0	356.4	360.7	365.0
94.0	350.5	354.8	359.1	363.4
96.0	348.9	353.3	357.6	361.8
98.0	347.4	351.7	356.0	360.2
100.0	345.8	350.2	354.5	358.7
102.0	344.3	348.7	352.9	357.1
104.0	342.8	347.2	351.4	355.6
106.0	341.4	345.7	349.9	354.1
108.0	339.9	344.2	348.4	352.6
110.0	338.4	342.7	347.0	351.1
112.0	337.0	341.3	345.5	349.7
114.0	335.5	339.8	344.1	348.2
116.0	334.1	338.4	342.6	346.8
118.0	332.7	337.0	341.2	345.4
120.0	331.3	335.6	339.8	343.9
122.0	329.9	334.2	338.4	342.5
124.0	328.6	332.8	337.0	341.1
126.0	327.2	331.5	335.6	339.8
128.0	325.9	330.1	334.3	338.4
130.0	324.5	328.8	332.9	337.0

Table 11-2. Argon Contents Table (SCF/cu ft)

°F	100 psig	200 psig	300 psig	400 psig	500 psig	600 psig	700 psig
-40.0	9.980	18.91	28.05	37.41	46.99	56.80	66.83
-38.0	9.930	18.81	27.90	37.20	46.72	56.45	66.40
-36.0	9.881	18.71	27.75	36.99	46.44	56.11	65.98
-34.0	9.832	18.62	27.60	36.78	46.18	55.77	65.57
-32.0	9.784	18.52	27.45	36.58	45.91	55.44	65.16
-30.0	9.736	18.43	27.31	36.38	45.65	55.11	64.76
-28.0	9.689	18.33	27.16	36.18	45.39	54.78	64.36
-26.0	9.642	18.24	27.02	35.99	45.13	54.46	63.97
-24.0	9.596	18.15	26.88	35.79	44.88	54.15	63.59
-22.0	9.550	18.06	26.74	35.60	44.63	53.84	63.21
-20.0	9.505	17.97	26.61	35.41	44.39	53.53	62.84
-18.0	9.460	17.88	26.47	35.23	44.14	53.23	62.47
-16.0	9.415	17.80	26.34	35.04	43.90	52.93	62.10
-14.0	9.371	17.71	26.21	34.86	43.67	52.63	61.75
-12.0	9.328	17.62	26.07	34.68	43.43	52.34	61.39
-10.0	9.285	17.54	25.94	34.50	43.20	52.05	61.04
-8.0	9.242	17.46	25.82	34.32	42.97	51.77	60.70
-6.0	9.199	17.37	25.69	34.15	42.75	51.49	60.36
-4.0	9.157	17.29	25.56	33.98	42.53	51.21	60.03
-2.0	9.116	17.21	25.44	33.81	42.31	50.94	59.70
0.0	9.075	17.13	25.32	33.64	42.09	50.67	59.37
2.0	9.034	17.05	25.20	33.47	41.87	50.40	59.05
4.0	8.993	16.97	25.08	33.31	41.66	50.14	58.73
6.0	8.953	16.89	24.96	33.14	41.45	49.88	58.42
8.0	8.913	16.82	24.84	32.98	41.24	49.62	58.11
10.0	8.874	16.74	24.72	32.82	41.04	49.36	57.80
12.0	8.835	16.66	24.61	32.66	40.83	49.11	57.50
14.0	8.797	16.59	24.49	32.51	40.63	48.86	57.20
16.0	8.758	16.51	24.38	32.35	40.43	48.62	56.90
18.0	8.720	16.44	24.27	32.20	40.24	48.38	56.61
20.0	8.683	16.37	24.16	32.05	40.04	48.14	56.32
22.0	8.645	16.29	24.05	31.90	39.85	47.90	56.04
24.0	8.608	16.22	23.94	31.75	39.66	47.66	55.75
26.0	8.572	16.15	23.83	31.61	39.47	47.43	55.48
28.0	8.535	16.08	23.72	31.46	39.29	47.20	55.20
30.0	8.500	16.01	23.62	31.32	39.10	46.97	54.93
32.0	8.464	15.94	23.51	31.17	38.92	46.75	54.66
34.0	8.428	15.87	23.41	31.03	38.74	46.53	54.39
36.0	8.393	15.81	23.31	30.89	38.56	46.31	54.13
38.0	8.359	15.74	23.21	30.75	38.38	46.09	53.87
40.0	8.324	15.67	23.10	30.62	38.21	45.88	53.61
42.0	8.290	15.61	23.00	30.48	38.04	45.66	53.36
44.0	8.256	15.54	22.91	30.35	37.86	45.45	53.11

Table 11-2. Argon Contents Table (SCF/cu ft) - Continued

°F	100 psig	200 psig	300 psig	400 psig	500 psig	600 psig	700 psig
46.0	8.222	15.48	22.81	30.21	37.69	45.24	52.86
48.0	8.189	15.41	22.71	30.08	37.53	45.04	52.61
50.0	8.156	15.35	22.61	29.95	37.36	44.83	52.37
52.0	8.123	15.29	22.52	29.82	37.19	44.63	52.13
54.0	8.091	15.22	22.42	29.70	37.03	44.43	51.89
56.0	8.058	15.16	22.33	29.57	36.87	44.23	51.65
58.0	8.026	15.10	22.24	29.44	36.71	44.03	51.42
60.0	7.995	15.04	22.15	29.32	36.55	43.84	51.18
62.0	7.963	14.98	22.06	29.19	36.39	43.65	50.95
64.0	7.932	14.92	21.96	29.07	36.24	43.46	50.73
66.0	7.901	14.86	21.87	28.95	36.08	43.27	50.50
68.0	7.870	14.80	21.79	28.83	35.93	43.08	50.28
70.0	7.840	14.74	21.70	28.71	35.78	42.90	50.06
72.0	7.810	14.68	21.61	28.59	35.63	42.71	49.84
74.0	7.780	14.62	21.52	28.48	35.48	42.53	49.63
76.0	7.750	14.57	21.44	28.36	35.33	42.35	49.41
78.0	7.720	14.51	21.35	28.25	35.19	42.17	49.20
80.0	7.691	14.45	21.27	28.13	35.04	42.00	48.99
82.0	7.662	14.40	21.18	28.02	34.90	41.82	48.78
84.0	7.633	14.34	21.10	27.91	34.76	41.65	48.58
86.0	7.604	14.29	21.02	27.80	34.62	41.48	48.37
88.0	7.576	14.23	20.94	27.69	34.48	41.31	48.17
90.0	7.548	14.18	20.86	27.58	34.34	41.14	47.97
92.0	7.520	14.13	20.78	27.47	34.20	40.97	47.77
94.0	7.492	14.07	20.70	27.36	34.07	40.80	47.58
96.0	7.464	14.02	20.62	27.26	33.93	40.64	47.38
98.0	7.437	13.97	20.54	27.15	33.80	40.48	47.19
100.0	7.410	13.92	20.46	27.05	33.66	40.32	47.00
102.0	7.383	13.86	20.38	26.94	33.53	40.16	46.81
104.0	7.356	13.81	20.31	26.84	33.40	40.00	46.62
106.0	7.330	13.76	20.23	26.74	33.27	39.84	46.43
108.0	7.303	13.71	20.16	26.63	33.15	39.68	46.25
110.0	7.277	13.66	20.08	26.53	33.02	39.53	46.07
112.0	7.251	13.61	20.01	26.43	32.89	39.38	45.89
114.0	7.225	13.56	19.93	26.34	32.77	39.22	45.71
116.0	7.200	13.51	19.86	26.24	32.64	39.07	45.53
118.0	7.174	13.47	19.79	26.14	32.52	38.92	45.35
120.0	7.149	13.42	19.72	26.04	32.40	38.78	45.18
122.0	7.124	13.37	19.64	25.95	32.28	38.63	45.00
124.0	7.099	13.32	19.57	25.85	32.16	38.48	44.83
126.0	7.074	13.27	19.50	25.76	32.04	38.34	44.66
128.0	7.050	13.23	19.43	25.67	31.92	38.20	44.49
130.0	7.025	13.18	19.36	25.57	31.80	38.05	44.32

Table 11-2. Argon Contents Table (SCF/cu ft) - Continued

°F	800 psig	900 psig	1000 psig	1100 psig	1200 psig	1300 psig	1400 psig
-40.0	77.08	87.53	98.20	109.1	120.1	131.3	142.6
-38.0	76.56	86.93	97.50	108.2	119.2	130.3	141.5
-36.0	76.06	86.34	96.80	107.5	118.3	129.2	140.3
-34.0	75.56	85.75	96.13	106.7	117.4	128.2	139.2
-32.0	75.08	85.18	95.46	105.9	116.5	127.3	138.1
-30.0	74.60	84.61	94.80	105.2	115.7	126.3	137.0
-28.0	74.12	84.06	94.16	104.4	114.8	125.4	136.0
-26.0	73.66	83.51	93.53	103.7	114.0	124.4	135.0
-24.0	73.20	82.97	92.91	103.0	113.2	123.5	134.0
-22.0	72.75	82.45	92.29	102.3	112.4	122.6	133.0
-20.0	72.30	81.92	91.69	101.6	111.6	121.8	132.0
-18.0	71.86	81.41	91.10	100.9	110.9	120.9	131.0
-16.0	71.43	80.91	90.52	100.3	110.1	120.1	130.1
-14.0	71.01	80.41	89.94	99.60	109.4	119.2	129.2
-12.0	70.59	79.92	89.38	98.96	108.6	118.4	128.3
-10.0	70.17	79.44	88.82	98.32	107.9	117.6	127.4
-8.0	69.77	78.96	88.27	97.70	107.2	116.8	126.5
-6.0	69.36	78.49	87.74	97.09	106.5	116.1	125.7
-4.0	68.97	78.03	87.20	96.48	105.9	115.3	124.8
-2.0	68.58	77.57	86.68	95.89	105.2	114.6	124.0
0.0	68.19	77.13	86.16	95.30	104.5	113.8	123.2
2.0	67.81	76.68	85.66	94.73	103.9	113.1	122.4
4.0	67.43	76.25	85.16	94.16	103.2	112.4	121.6
6.0	67.06	75.81	84.66	93.60	102.6	111.7	120.8
8.0	66.70	75.39	84.17	93.05	102.0	111.0	120.1
10.0	66.34	74.97	83.69	92.50	101.4	110.3	119.3
12.0	65.98	74.56	83.22	91.97	100.8	109.7	118.6
14.0	65.63	74.15	82.75	91.44	100.2	109.0	117.9
16.0	65.28	73.74	82.29	90.92	99.60	108.4	117.1
18.0	64.94	73.35	81.84	90.40	99.03	107.7	116.4
20.0	64.60	72.95	81.39	89.89	98.46	107.1	115.7
22.0	64.26	72.57	80.95	89.39	97.90	106.5	115.1
24.0	63.93	72.18	80.51	88.90	97.35	105.8	114.4
26.0	63.60	71.81	80.08	88.41	96.81	105.2	113.7
28.0	63.28	71.43	79.65	87.93	96.27	104.6	113.1
30.0	62.96	71.06	79.23	87.46	95.74	104.1	112.4
32.0	62.64	70.70	78.82	86.99	95.22	103.5	111.8
34.0	62.33	70.34	78.41	86.53	94.70	102.9	111.2
36.0	62.02	69.98	78.00	86.07	94.19	102.3	110.5
38.0	61.72	69.63	77.60	85.62	93.69	101.8	109.9
40.0	61.42	69.28	77.20	85.18	93.19	101.2	109.3
42.0	61.12	68.94	76.81	84.74	92.70	100.7	108.7
44.0	60.82	68.60	76.43	84.30	92.22	100.2	108.1
46.0	60.53	68.26	76.05	83.87	91.74	99.64	107.6

Table 11-2. Argon Contents Table (SCF/cu ft) - Continued

°F	800 psig	900 psig	1000 psig	1100 psig	1200 psig	1300 psig	1400 psig
48.0	60.24	67.93	75.67	83.45	91.27	99.12	107.0
50.0	59.96	67.60	75.30	83.03	90.80	98.61	106.4
52.0	59.68	67.28	74.93	82.62	90.34	98.10	105.9
54.0	59.40	66.96	74.56	82.21	89.89	97.60	105.3
56.0	59.12	66.64	74.20	81.81	89.44	97.10	104.8
58.0	58.85	66.33	73.85	81.41	89.00	96.61	104.2
60.0	58.58	66.02	73.50	81.01	88.56	96.13	103.7
62.0	58.31	65.71	73.15	80.62	88.12	95.65	103.2
64.0	58.05	65.41	72.80	80.24	87.69	95.18	102.7
66.0	57.78	65.11	72.46	79.85	87.27	94.71	102.2
68.0	57.52	64.81	72.13	79.48	86.85	94.25	101.7
70.0	57.27	64.51	71.79	79.10	86.44	93.79	101.2
72.0	57.01	64.22	71.46	78.73	86.03	93.34	100.7
74.0	56.76	63.93	71.14	78.37	85.62	92.89	100.2
76.0	56.51	63.65	70.81	78.01	85.22	92.45	99.70
78.0	56.27	63.37	70.50	77.65	84.83	92.02	99.22
80.0	56.02	63.09	70.18	77.30	84.43	91.59	98.75
82.0	55.78	62.81	69.87	76.95	84.05	91.16	98.28
84.0	55.54	62.54	69.56	76.60	83.66	90.74	97.82
86.0	55.30	62.26	69.25	76.26	83.28	90.32	97.37
88.0	55.07	62.00	68.95	75.92	82.91	89.91	96.92
90.0	54.84	61.73	68.65	75.58	82.54	89.50	96.47
92.0	54.61	61.47	68.35	75.25	82.17	89.10	96.03
94.0	54.38	61.21	68.06	74.92	81.81	88.70	95.60
96.0	54.15	60.95	67.76	74.60	81.45	88.30	95.17
98.0	53.93	60.69	67.48	74.28	81.09	87.91	94.74
100.0	53.71	60.44	67.19	73.96	80.74	87.52	94.32
102.0	53.49	60.19	66.91	73.64	80.39	87.14	93.90
104.0	53.27	59.94	66.63	73.33	80.04	86.76	93.49
106.0	53.05	59.69	66.35	73.02	79.70	86.39	93.08
108.0	52.84	59.45	66.07	72.71	79.36	86.01	92.67
110.0	52.63	59.21	65.80	72.41	79.02	85.65	92.27
112.0	52.42	58.97	65.53	72.11	78.69	85.28	91.87
114.0	52.21	58.73	65.26	71.81	78.36	84.92	91.48
116.0	52.00	58.49	65.00	71.51	78.04	84.56	91.09
118.0	51.80	58.26	64.74	71.22	77.71	84.21	90.71
120.0	51.59	58.03	64.48	70.93	77.39	83.86	90.33
122.0	51.39	57.80	64.22	70.64	77.08	83.51	89.95
124.0	51.19	57.57	63.96	70.36	76.76	83.17	89.57
126.0	51.00	57.35	63.71	70.08	76.45	82.83	89.20
128.0	50.80	57.12	63.46	69.80	76.15	82.49	88.84
130.0	50.61	56.90	63.21	69.52	75.84	82.16	88.47

Table 11-2. Argon Contents Table (SCF/cu ft) - Continued

°F	1500 psig	1600 psig	1700 psig	1800 psig	1900 psig	2000 psig	2100 psig
-40.0	154.1	165.6	177.2	188.9	200.5	212.1	223.6
-38.0	152.8	164.2	175.7	187.2	198.7	210.1	221.5
-36.0	151.5	162.8	174.2	185.5	196.9	208.2	219.5
-34.0	150.3	161.4	172.7	183.9	195.1	206.3	217.5
-32.0	149.1	160.1	171.2	182.3	193.4	204.5	215.5
-30.0	147.9	158.8	169.8	180.8	191.8	202.7	213.6
-28.0	146.7	157.5	168.4	179.3	190.1	201.0	211.7
-26.0	145.6	156.3	167.0	177.8	188.5	199.2	209.9
-24.0	144.5	155.1	165.7	176.3	187.0	197.6	208.1
-22.0	143.4	153.9	164.4	174.9	185.4	195.9	206.4
-20.0	142.3	152.7	163.1	173.5	183.9	194.3	204.7
-18.0	141.3	151.5	161.8	172.2	182.5	192.8	203.0
-16.0	140.2	150.4	160.6	170.8	181.0	191.2	201.4
-14.0	139.2	149.3	159.4	169.5	179.6	189.7	199.8
-12.0	138.2	148.2	158.2	168.2	178.3	188.2	198.2
-10.0	137.2	147.1	157.0	167.0	176.9	186.8	196.7
-8.0	136.3	146.1	155.9	165.7	175.6	185.4	195.2
-6.0	135.3	145.0	154.8	164.5	174.3	184.0	193.7
-4.0	134.4	144.0	153.7	163.3	173.0	182.6	192.2
-2.0	133.5	143.0	152.6	162.2	171.7	181.3	190.8
0.0	132.6	142.1	151.5	161.0	170.5	180.0	189.4
2.0	131.7	141.1	150.5	159.9	169.3	178.7	188.0
4.0	130.9	140.2	149.5	158.8	168.1	177.4	186.7
6.0	130.0	139.2	148.5	157.7	167.0	176.2	185.4
8.0	129.2	138.3	147.5	156.7	165.8	175.0	184.1
10.0	128.4	137.4	146.5	155.6	164.7	173.8	182.8
12.0	127.6	136.6	145.6	154.6	163.6	172.6	181.5
14.0	126.8	135.7	144.6	153.6	162.5	171.4	180.3
16.0	126.0	134.8	143.7	152.6	161.4	170.3	179.1
18.0	125.2	134.0	142.8	151.6	160.4	169.2	177.9
20.0	124.4	133.2	141.9	150.6	159.4	168.1	176.7
22.0	123.7	132.4	141.0	149.7	158.3	167.0	175.6
24.0	123.0	131.5	140.2	148.8	157.3	165.9	174.5
26.0	122.2	130.8	139.3	147.8	156.4	164.9	173.4
28.0	121.5	130.0	138.5	146.9	155.4	163.8	172.3
30.0	120.8	129.2	137.6	146.0	154.4	162.8	171.2
32.0	120.1	128.5	136.8	145.2	153.5	161.8	170.1
34.0	119.4	127.7	136.0	144.3	152.6	160.8	169.1
36.0	118.8	127.0	135.2	143.4	151.7	159.9	168.0
38.0	118.1	126.3	134.4	142.6	150.8	158.9	167.0
40.0	117.4	125.5	133.7	141.8	149.9	158.0	166.0
42.0	116.8	124.8	132.9	141.0	149.0	157.0	165.0
44.0	116.1	124.1	132.2	140.2	148.2	156.1	164.1
46.0	115.5	123.5	131.4	139.4	147.3	155.2	163.1

Table 11-2. Argon Contents Table (SCF/cu ft) - Continued

°F	1500 psig	1600 psig	1700 psig	1800 psig	1900 psig	2000 psig	2100 psig
48.0	114.9	122.8	130.7	138.6	146.5	154.3	162.2
50.0	114.3	122.1	130.0	137.8	145.7	153.5	161.2
52.0	113.7	121.5	129.3	137.1	144.8	152.6	160.3
54.0	113.1	120.8	128.6	136.3	144.0	151.8	159.4
56.0	112.5	120.2	127.9	135.6	143.3	150.9	158.5
58.0	111.9	119.5	127.2	134.8	142.5	150.1	157.7
60.0	111.3	118.9	126.5	134.1	141.7	149.3	156.8
62.0	110.7	118.3	125.9	133.4	140.9	148.5	155.9
64.0	110.2	117.7	125.2	132.7	140.2	147.7	155.1
66.0	109.6	117.1	124.6	132.0	139.5	146.9	154.3
68.0	109.1	116.5	123.9	131.3	138.7	146.1	153.4
70.0	108.5	115.9	123.3	130.7	138.0	145.3	152.6
72.0	108.0	115.3	122.7	130.0	137.3	144.6	151.8
74.0	107.5	114.8	122.1	129.3	136.6	143.8	151.0
76.0	106.9	114.2	121.4	128.7	135.9	143.1	150.3
78.0	106.4	113.6	120.8	128.0	135.2	142.4	149.5
80.0	105.9	113.1	120.2	127.4	134.5	141.7	148.7
82.0	105.4	112.5	119.7	126.8	133.9	140.9	148.0
84.0	104.9	112.0	119.1	126.2	133.2	140.2	147.2
86.0	104.4	111.5	118.5	125.5	132.6	139.5	146.5
88.0	103.9	110.9	117.9	124.9	131.9	138.9	145.8
90.0	103.4	110.4	117.4	124.3	131.3	138.2	145.1
92.0	103.0	109.9	116.8	123.7	130.6	137.5	144.4
94.0	102.5	109.4	116.3	123.2	130.0	136.9	143.7
96.0	102.0	108.9	115.7	122.6	129.4	136.2	143.0
98.0	101.6	108.4	115.2	122.0	128.8	135.6	142.3
100.0	101.1	107.9	114.7	121.4	128.2	134.9	141.6
102.0	100.7	107.4	114.2	120.9	127.6	134.3	141.0
104.0	100.2	106.9	113.6	120.3	127.0	133.7	140.3
106.0	99.76	106.4	113.1	119.8	126.4	133.0	139.6
108.0	99.33	106.0	112.6	119.2	125.8	132.4	139.0
110.0	98.89	105.5	112.1	118.7	125.3	131.8	138.4
112.0	98.46	105.0	111.6	118.2	124.7	131.2	137.7
114.0	98.04	104.6	111.1	117.7	124.2	130.6	137.1
116.0	97.62	104.1	110.6	117.1	123.6	130.1	136.5
118.0	97.20	103.7	110.2	116.6	123.1	129.5	135.9
120.0	96.79	103.2	109.7	116.1	122.5	128.9	135.3
122.0	96.38	102.8	109.2	115.6	122.0	128.3	134.7
124.0	95.97	102.4	108.7	115.1	121.5	127.8	134.1
126.0	95.57	101.9	108.3	114.6	120.9	127.2	133.5
128.0	95.18	101.5	107.8	114.1	120.4	126.7	132.9
130.0	94.78	101.1	107.4	113.6	119.9	126.1	132.3

Table 11-2. Argon Contents Table (SCF/cu ft) - Continued

°F	2200 psig	2300 psig	2400 psig	2500 psig	2600 psig	2700 psig	2800 psig
-40.0	235.0	246.2	257.3	268.2	278.8	289.1	299.3
-38.0	232.8	243.9	254.9	265.6	276.1	286.4	296.5
-36.0	230.6	241.6	252.5	263.1	273.6	283.8	293.8
-34.0	228.5	239.4	250.1	260.7	271.1	281.2	291.1
-32.0	226.4	237.2	247.9	258.3	268.6	278.7	288.5
-30.0	224.4	235.1	245.6	256.0	266.2	276.2	285.9
-28.0	222.4	233.0	243.4	253.7	263.8	273.7	283.4
-26.0	220.5	231.0	241.3	251.5	261.5	271.3	281.0
-24.0	218.6	229.0	239.2	249.3	259.3	269.0	278.6
-22.0	216.8	227.0	237.2	247.2	257.0	266.7	276.2
-20.0	215.0	225.1	235.2	245.1	254.9	264.5	273.9
-18.0	213.2	223.3	233.2	243.1	252.8	262.3	271.6
-16.0	211.4	221.4	231.3	241.1	250.7	260.1	269.4
-14.0	209.8	219.6	229.4	239.1	248.6	258.0	267.2
-12.0	208.1	217.9	227.6	237.2	246.6	255.9	265.1
-10.0	206.5	216.2	225.8	235.3	244.7	253.9	263.0
-8.0	204.9	214.5	224.0	233.5	242.8	251.9	260.9
-6.0	203.3	212.8	222.3	231.6	240.9	250.0	258.9
-4.0	201.8	211.2	220.6	229.9	239.0	248.0	256.9
-2.0	200.3	209.6	218.9	228.1	237.2	246.1	255.0
0.0	198.8	208.1	217.3	226.4	235.4	244.3	253.0
2.0	197.3	206.5	215.7	224.7	233.7	242.5	251.2
4.0	195.9	205.0	214.1	223.1	231.9	240.7	249.3
6.0	194.5	203.6	212.6	221.5	230.3	238.9	247.5
8.0	193.1	202.1	211.0	219.9	228.6	237.2	245.7
10.0	191.8	200.7	209.5	218.3	227.0	235.5	244.0
12.0	190.5	199.3	208.1	216.8	225.4	233.9	242.3
14.0	189.2	197.9	206.6	215.3	223.8	232.2	240.6
16.0	187.9	196.6	205.2	213.8	222.3	230.6	238.9
18.0	186.6	195.3	203.8	212.3	220.7	229.1	237.3
20.0	185.4	194.0	202.5	210.9	219.2	227.5	235.7
22.0	184.2	192.7	201.1	209.5	217.8	226.0	234.1
24.0	183.0	191.4	199.8	208.1	216.3	224.5	232.5
26.0	181.8	190.2	198.5	206.7	214.9	223.0	231.0
28.0	180.6	188.9	197.2	205.4	213.5	221.5	229.5
30.0	179.5	187.7	196.0	204.1	212.1	220.1	228.0
32.0	178.4	186.6	194.7	202.8	210.8	218.7	226.5
34.0	177.3	185.4	193.5	201.5	209.5	217.3	225.1
36.0	176.2	184.3	192.3	200.2	208.1	216.0	223.7
38.0	175.1	183.1	191.1	199.0	206.9	214.6	222.3
40.0	174.0	182.0	189.9	197.8	205.6	213.3	220.9
42.0	173.0	180.9	188.8	196.6	204.3	212.0	219.6
44.0	172.0	179.8	187.7	195.4	203.1	210.7	218.2
46.0	171.0	178.8	186.5	194.2	201.9	209.4	216.9

Table 11-2. Argon Contents Table (SCF/cu ft) - Continued

°F	2200 psig	2300 psig	2400 psig	2500 psig	2600 psig	2700 psig	2800 psig
48.0	170.0	177.7	185.4	193.1	200.7	208.2	215.6
50.0	169.0	176.7	184.4	192.0	199.5	207.0	214.4
52.0	168.0	175.7	183.3	190.8	198.3	205.7	213.1
54.0	167.1	174.7	182.2	189.7	197.2	204.6	211.9
56.0	166.1	173.7	181.2	188.7	196.0	203.4	210.6
58.0	165.2	172.7	180.2	187.6	194.9	202.2	209.4
60.0	164.3	171.8	179.2	186.5	193.8	201.1	208.2
62.0	163.4	170.8	178.2	185.5	192.7	199.9	207.1
64.0	162.5	169.9	177.2	184.5	191.7	198.8	205.9
66.0	161.6	169.0	176.2	183.5	190.6	197.7	204.8
68.0	160.8	168.0	175.3	182.5	189.6	196.6	203.7
70.0	159.9	167.1	174.3	181.5	188.6	195.6	202.5
72.0	159.1	166.3	173.4	180.5	187.5	194.5	201.4
74.0	158.2	165.4	172.5	179.5	186.5	193.5	200.4
76.0	157.4	164.5	171.6	178.6	185.5	192.5	199.3
78.0	156.6	163.7	170.7	177.7	184.6	191.4	198.2
80.0	155.8	162.8	169.8	176.7	183.6	190.4	197.2
82.0	155.0	162.0	168.9	175.8	182.7	189.4	196.2
84.0	154.2	161.2	168.1	174.9	181.7	188.5	195.2
86.0	153.4	160.3	167.2	174.0	180.8	187.5	194.2
88.0	152.7	159.5	166.4	173.1	179.9	186.6	193.2
90.0	151.9	158.8	165.5	172.3	179.0	185.6	192.2
92.0	151.2	158.0	164.7	171.4	178.1	184.7	191.2
94.0	150.5	157.2	163.9	170.6	177.2	183.8	190.3
96.0	149.7	156.4	163.1	169.7	176.3	182.9	189.3
98.0	149.0	155.7	162.3	168.9	175.5	182.0	188.4
100.0	148.3	154.9	161.5	168.1	174.6	181.1	187.5
102.0	147.6	154.2	160.8	167.3	173.8	180.2	186.6
104.0	146.9	153.5	160.0	166.5	172.9	179.3	185.7
106.0	146.2	152.7	159.2	165.7	172.1	178.5	184.8
108.0	145.5	152.0	158.5	164.9	171.3	177.6	183.9
110.0	144.9	151.3	157.8	164.1	170.5	176.8	183.0
112.0	144.2	150.6	157.0	163.4	169.7	176.0	182.2
114.0	143.5	149.9	156.3	162.6	168.9	175.2	181.3
116.0	142.9	149.3	155.6	161.9	168.1	174.3	180.5
118.0	142.2	148.6	154.9	161.1	167.4	173.5	179.7
120.0	141.6	147.9	154.2	160.4	166.6	172.8	178.9
122.0	141.0	147.3	153.5	159.7	165.9	172.0	178.0
124.0	140.4	146.6	152.8	159.0	165.1	171.2	177.2
126.0	139.7	146.0	152.1	158.3	164.4	170.4	176.4
128.0	139.1	145.3	151.5	157.6	163.6	169.7	175.7
130.0	138.5	144.7	150.8	156.9	162.9	168.9	174.9

Table 11-2. Argon Contents Table (SCF/cu ft) - Continued

°F	2900 psig	3000 psig	3100 psig	3200 psig	3300 psig	3400 psig	3500 psig
-40.0	309.1	318.6	327.9	336.8	345.5	353.9	362.0
-38.0	306.2	315.7	324.9	333.9	342.5	350.9	359.0
-36.0	303.5	312.9	322.1	331.0	339.6	347.9	356.0
-34.0	300.7	310.1	319.2	328.1	336.7	345.0	353.1
-32.0	298.1	307.4	316.5	325.3	333.9	342.2	350.2
-30.0	295.4	304.7	313.8	322.5	331.1	339.3	347.4
-28.0	292.9	302.1	311.1	319.8	328.3	336.6	344.6
-26.0	290.4	299.5	308.5	317.2	325.6	333.9	341.8
-24.0	287.9	297.0	305.9	314.6	323.0	331.2	339.1
-22.0	285.5	294.5	303.4	312.0	320.4	328.5	336.5
-20.0	283.1	292.1	300.9	309.5	317.8	326.0	333.9
-18.0	280.8	289.7	298.5	307.0	315.3	323.4	331.3
-16.0	278.5	287.4	296.1	304.6	312.8	320.9	328.8
-14.0	276.2	285.1	293.7	302.2	310.4	318.4	326.3
-12.0	274.0	282.8	291.4	299.8	308.0	316.0	323.8
-10.0	271.9	280.6	289.1	297.5	305.7	313.6	321.4
-8.0	269.8	278.4	286.9	295.2	303.3	311.3	319.0
-6.0	267.7	276.3	284.7	293.0	301.1	309.0	316.7
-4.0	265.6	274.2	282.6	290.8	298.8	306.7	314.4
-2.0	263.6	272.1	280.5	288.6	296.6	304.4	312.1
0.0	261.6	270.1	278.4	286.5	294.5	302.2	309.8
2.0	259.7	268.1	276.3	284.4	292.3	300.1	307.6
4.0	257.8	266.1	274.3	282.4	290.2	297.9	305.5
6.0	255.9	264.2	272.4	280.3	288.2	295.8	303.3
8.0	254.1	262.3	270.4	278.4	286.1	293.8	301.2
10.0	252.3	260.5	268.5	276.4	284.1	291.7	299.2
12.0	250.5	258.6	266.6	274.5	282.2	289.7	297.1
14.0	248.8	256.8	264.8	272.6	280.2	287.8	295.1
16.0	247.0	255.1	263.0	270.7	278.3	285.8	293.1
18.0	245.4	253.3	261.2	268.9	276.5	283.9	291.2
20.0	243.7	251.6	259.4	267.1	274.6	282.0	289.3
22.0	242.1	249.9	257.7	265.3	272.8	280.2	287.4
24.0	240.5	248.3	256.0	263.6	271.0	278.3	285.5
26.0	238.9	246.6	254.3	261.8	269.3	276.5	283.7
28.0	237.3	245.0	252.6	260.1	267.5	274.8	281.9
30.0	235.8	243.5	251.0	258.5	265.8	273.0	280.1
32.0	234.3	241.9	249.4	256.8	264.1	271.3	278.3
34.0	232.8	240.4	247.8	255.2	262.5	269.6	276.6
36.0	231.3	238.9	246.3	253.6	260.8	267.9	274.9
38.0	229.9	237.4	244.8	252.0	259.2	266.3	273.2
40.0	228.5	235.9	243.2	250.5	257.6	264.6	271.6
42.0	227.1	234.5	241.8	249.0	256.1	263.0	269.9
44.0	225.7	233.0	240.3	247.5	254.5	261.5	268.3
46.0	224.3	231.6	238.9	246.0	253.0	259.9	266.7

Table 11-2. Argon Contents Table (SCF/cu ft) - Continued

°F	2900 psig	3000 psig	3100 psig	3200 psig	3300 psig	3400 psig	3500 psig
48.0	223.0	230.3	237.4	244.5	251.5	258.4	265.1
50.0	221.7	228.9	236.0	243.1	250.0	256.9	263.6
52.0	220.4	227.5	234.6	241.6	248.6	255.4	262.1
54.0	219.1	226.2	233.3	240.2	247.1	253.9	260.6
56.0	217.8	224.9	231.9	238.9	245.7	252.4	259.1
58.0	216.6	223.6	230.6	237.5	244.3	251.0	257.6
60.0	215.3	222.4	229.3	236.1	242.9	249.6	256.2
62.0	214.1	221.1	228.0	234.8	241.5	248.2	254.7
64.0	212.9	219.9	226.7	233.5	240.2	246.8	253.3
66.0	211.8	218.7	225.5	232.2	238.9	245.4	251.9
68.0	210.6	217.4	224.2	230.9	237.6	244.1	250.6
70.0	209.4	216.3	223.0	229.7	236.3	242.8	249.2
72.0	208.3	215.1	221.8	228.4	235.0	241.5	247.9
74.0	207.2	213.9	220.6	227.2	233.7	240.2	246.5
76.0	206.1	212.8	219.4	226.0	232.5	238.9	245.2
78.0	205.0	211.7	218.3	224.8	231.3	237.6	243.9
80.0	203.9	210.6	217.1	223.6	230.0	236.4	242.7
82.0	202.8	209.5	216.0	222.5	228.8	235.2	241.4
84.0	201.8	208.4	214.9	221.3	227.7	233.9	240.2
86.0	200.8	207.3	213.8	220.2	226.5	232.7	238.9
88.0	199.7	206.2	212.7	219.0	225.3	231.6	237.7
90.0	198.7	205.2	211.6	217.9	224.2	230.4	236.5
92.0	197.7	204.2	210.5	216.8	223.1	229.2	235.3
94.0	196.7	203.1	209.5	215.8	222.0	228.1	234.2
96.0	195.8	202.1	208.4	214.7	220.9	227.0	233.0
98.0	194.8	201.1	207.4	213.6	219.8	225.8	231.9
100.0	193.9	200.2	206.4	212.6	218.7	224.7	230.7
102.0	192.9	199.2	205.4	211.5	217.6	223.7	229.6
104.0	192.0	198.2	204.4	210.5	216.6	222.6	228.5
106.0	191.1	197.3	203.4	209.5	215.5	221.5	227.4
108.0	190.2	196.3	202.5	208.5	214.5	220.5	226.3
110.0	189.3	195.4	201.5	207.5	213.5	219.4	225.3
112.0	188.4	194.5	200.5	206.6	212.5	218.4	224.2
114.0	187.5	193.6	199.6	205.6	211.5	217.4	223.2
116.0	186.6	192.7	198.7	204.6	210.5	216.4	222.1
118.0	185.8	191.8	197.8	203.7	209.6	215.4	221.1
120.0	184.9	190.9	196.9	202.8	208.6	214.4	220.1
122.0	184.1	190.0	196.0	201.8	207.6	213.4	219.1
124.0	183.2	189.2	195.1	200.9	206.7	212.4	218.1
126.0	182.4	188.3	194.2	200.0	205.8	211.5	217.1
128.0	181.6	187.5	193.3	199.1	204.9	210.5	216.2
130.0	180.8	186.7	192.5	198.2	203.9	209.6	215.2

Table 11-2. Argon Contents Table (SCF/cu ft) - Continued

°F	3600 psig	3700 psig	3800 psig	3900 psig	4000 psig	4100 psig	4200 psig
-40.0	369.8	377.4	384.7	391.7	398.6	405.2	411.6
-38.0	366.8	374.3	381.7	388.7	395.6	402.2	408.6
-36.0	363.8	371.4	378.7	385.8	392.6	399.2	405.7
-34.0	360.9	368.4	375.7	382.8	389.7	396.3	402.7
-32.0	358.0	365.5	372.8	379.9	386.8	393.4	399.9
-30.0	355.1	362.7	370.0	377.1	383.9	390.6	397.0
-28.0	352.3	359.9	367.2	374.2	381.1	387.8	394.2
-26.0	349.6	357.1	364.4	371.5	378.3	385.0	391.4
-24.0	346.9	354.4	361.6	368.7	375.6	382.2	388.7
-22.0	344.2	351.7	358.9	366.0	372.8	379.5	386.0
-20.0	341.5	349.0	356.3	363.3	370.2	376.8	383.3
-18.0	339.0	346.4	353.6	360.7	367.5	374.2	380.6
-16.0	336.4	343.8	351.1	358.1	364.9	371.6	378.0
-14.0	333.9	341.3	348.5	355.5	362.3	369.0	375.4
-12.0	331.4	338.8	346.0	353.0	359.8	366.4	372.9
-10.0	328.9	336.3	343.5	350.5	357.3	363.9	370.3
-8.0	326.5	333.9	341.0	348.0	354.8	361.4	367.9
-6.0	324.2	331.5	338.6	345.6	352.4	359.0	365.4
-4.0	321.8	329.1	336.3	343.2	350.0	356.5	363.0
-2.0	319.5	326.8	333.9	340.8	347.6	354.2	360.6
0.0	317.3	324.5	331.6	338.5	345.2	351.8	358.2
2.0	315.0	322.3	329.3	336.2	342.9	349.5	355.9
4.0	312.8	320.0	327.1	333.9	340.6	347.2	353.6
6.0	310.7	317.9	324.9	331.7	338.4	344.9	351.3
8.0	308.5	315.7	322.7	329.5	336.2	342.7	349.0
10.0	306.4	313.6	320.5	327.3	334.0	340.5	346.8
12.0	304.4	311.5	318.4	325.2	331.8	338.3	344.6
14.0	302.3	309.4	316.3	323.1	329.7	336.1	342.4
16.0	300.3	307.4	314.2	321.0	327.6	334.0	340.3
18.0	298.3	305.4	312.2	318.9	325.5	331.9	338.2
20.0	296.4	303.4	310.2	316.9	323.4	329.8	336.1
22.0	294.5	301.4	308.2	314.9	321.4	327.8	334.0
24.0	292.6	299.5	306.3	312.9	319.4	325.8	332.0
26.0	290.7	297.6	304.3	311.0	317.4	323.8	330.0
28.0	288.9	295.7	302.4	309.0	315.5	321.8	328.0
30.0	287.1	293.9	300.6	307.1	313.6	319.9	326.1
32.0	285.3	292.1	298.7	305.3	311.7	318.0	324.1
34.0	283.5	290.3	296.9	303.4	309.8	316.1	322.2
36.0	281.8	288.5	295.1	301.6	308.0	314.2	320.3
38.0	280.0	286.8	293.3	299.8	306.1	312.4	318.5
40.0	278.4	285.0	291.6	298.0	304.3	310.5	316.6
42.0	276.7	283.3	289.9	296.3	302.6	308.8	314.8
44.0	275.0	281.7	288.2	294.5	300.8	307.0	313.0
46.0	273.4	280.0	286.5	292.8	299.1	305.2	311.2

Table 11-2. Argon Contents Table (SCF/cu ft) - Continued

°F	3600 psig	3700 psig	3800 psig	3900 psig	4000 psig	4100 psig	4200 psig
48.0	271.8	278.4	284.8	291.2	297.4	303.5	309.5
50.0	270.2	276.8	283.2	289.5	295.7	301.8	307.8
52.0	268.7	275.2	281.6	287.9	294.0	300.1	306.1
54.0	267.1	273.6	280.0	286.2	292.4	298.4	304.4
56.0	265.6	272.1	278.4	284.6	290.8	296.8	302.7
58.0	264.1	270.5	276.8	283.0	289.2	295.2	301.1
60.0	262.6	269.0	275.3	281.5	287.6	293.6	299.4
62.0	261.2	267.5	273.8	279.9	286.0	292.0	297.8
64.0	259.7	266.1	272.3	278.4	284.5	290.4	296.2
66.0	258.3	264.6	270.8	276.9	282.9	288.8	294.7
68.0	256.9	263.2	269.4	275.4	281.4	287.3	293.1
70.0	255.5	261.8	267.9	274.0	279.9	285.8	291.6
72.0	254.2	260.4	266.5	272.5	278.5	284.3	290.1
74.0	252.8	259.0	265.1	271.1	277.0	282.8	288.6
76.0	251.5	257.6	263.7	269.7	275.6	281.4	287.1
78.0	250.1	256.3	262.3	268.3	274.1	279.9	285.6
80.0	248.8	254.9	261.0	266.9	272.7	278.5	284.2
82.0	247.6	253.6	259.6	265.5	271.4	277.1	282.7
84.0	246.3	252.3	258.3	264.2	270.0	275.7	281.3
86.0	245.0	251.0	257.0	262.8	268.6	274.3	279.9
88.0	243.8	249.8	255.7	261.5	267.3	273.0	278.5
90.0	242.6	248.5	254.4	260.2	266.0	271.6	277.2
92.0	241.3	247.3	253.2	258.9	264.6	270.3	275.8
94.0	240.1	246.1	251.9	257.7	263.3	269.0	274.5
96.0	239.0	244.9	250.7	256.4	262.1	267.7	273.2
98.0	237.8	243.7	249.4	255.2	260.8	266.4	271.9
100.0	236.6	242.5	248.2	253.9	259.5	265.1	270.6
102.0	235.5	241.3	247.0	252.7	258.3	263.8	269.3
104.0	234.4	240.1	245.9	251.5	257.1	262.6	268.0
106.0	233.2	239.0	244.7	250.3	255.9	261.4	266.8
108.0	232.1	237.9	243.5	249.1	254.7	260.1	265.5
110.0	231.0	236.8	242.4	248.0	253.5	258.9	264.3
112.0	230.0	235.6	241.3	246.8	252.3	257.7	263.1
114.0	228.9	234.6	240.2	245.7	251.2	256.5	261.9
116.0	227.8	233.5	239.1	244.6	250.0	255.4	260.7
118.0	226.8	232.4	238.0	243.4	248.9	254.2	259.5
120.0	225.7	231.3	236.9	242.3	247.7	253.1	258.3
122.0	224.7	230.3	235.8	241.2	246.6	251.9	257.2
124.0	223.7	229.3	234.7	240.2	245.5	250.8	256.1
126.0	222.7	228.2	233.7	239.1	244.4	249.7	254.9
128.0	221.7	227.2	232.7	238.0	243.4	248.6	253.8
130.0	220.7	226.2	231.6	237.0	242.3	247.5	252.7

Table 11-2. Argon Contents Table (SCF/cu ft) - Continued

°F	4300 psig	4400 psig	4500 psig	4600 psig	4700 psig	4800 psig	4900 psig
-40.0	417.8	423.8	429.6	435.2	440.7	446.0	451.1
-38.0	414.8	420.8	426.6	432.3	437.8	443.1	448.2
-36.0	411.9	417.9	423.7	429.4	434.9	440.2	445.4
-34.0	409.0	415.0	420.9	426.5	432.1	437.4	442.6
-32.0	406.1	412.1	418.0	423.7	429.2	434.6	439.8
-30.0	403.3	409.3	415.2	420.9	426.4	431.8	437.1
-28.0	400.5	406.5	412.4	418.1	423.7	429.1	434.3
-26.0	397.7	403.8	409.7	415.4	421.0	426.4	431.6
-24.0	394.9	401.0	406.9	412.7	418.2	423.7	428.9
-22.0	392.2	398.3	404.2	410.0	415.6	421.0	426.3
-20.0	389.5	395.6	401.6	407.3	412.9	418.4	423.7
-18.0	386.9	393.0	398.9	404.7	410.3	415.7	421.1
-16.0	384.3	390.4	396.3	402.1	407.7	413.2	418.5
-14.0	381.7	387.8	393.7	399.5	405.1	410.6	415.9
-12.0	379.1	385.2	391.2	397.0	402.6	408.1	413.4
-10.0	376.6	382.7	388.6	394.4	400.1	405.5	410.9
-8.0	374.1	380.2	386.2	391.9	397.6	403.1	408.4
-6.0	371.7	377.7	383.7	389.5	395.1	400.6	405.9
-4.0	369.2	375.3	381.2	387.0	392.7	398.2	403.5
-2.0	366.8	372.9	378.8	384.6	390.2	395.7	401.1
0.0	364.4	370.5	376.4	382.2	387.9	393.4	398.7
2.0	362.1	368.2	374.1	379.9	385.5	391.0	396.4
4.0	359.8	365.8	371.8	377.5	383.2	388.7	394.0
6.0	357.5	363.5	369.5	375.2	380.9	386.4	391.7
8.0	355.2	361.3	367.2	372.9	378.6	384.1	389.4
10.0	353.0	359.0	364.9	370.7	376.3	381.8	387.2
12.0	350.8	356.8	362.7	368.5	374.1	379.6	384.9
14.0	348.6	354.6	360.5	366.3	371.9	377.4	382.7
16.0	346.4	352.5	358.3	364.1	369.7	375.2	380.5
18.0	344.3	350.3	356.2	361.9	367.5	373.0	378.4
20.0	342.2	348.2	354.1	359.8	365.4	370.9	376.2
22.0	340.2	346.1	352.0	357.7	363.3	368.7	374.1
24.0	338.1	344.1	349.9	355.6	361.2	366.7	372.0
26.0	336.1	342.0	347.9	353.5	359.1	364.6	369.9
28.0	334.1	340.0	345.8	351.5	357.1	362.5	367.9
30.0	332.1	338.0	343.8	349.5	355.1	360.5	365.8
32.0	330.2	336.1	341.9	347.5	353.1	358.5	363.8
34.0	328.2	334.1	339.9	345.6	351.1	356.5	361.8
36.0	326.3	332.2	338.0	343.6	349.1	354.5	359.9
38.0	324.5	330.3	336.1	341.7	347.2	352.6	357.9
40.0	322.6	328.4	334.2	339.8	345.3	350.7	356.0
42.0	320.8	326.6	332.3	337.9	343.4	348.8	354.1
44.0	318.9	324.8	330.5	336.1	341.5	346.9	352.2
46.0	317.2	323.0	328.6	334.2	339.7	345.1	350.3

Table 11-2. Argon Contents Table (SCF/cu ft) - Continued

°F	4300 psig	4400 psig	4500 psig	4600 psig	4700 psig	4800 psig	4900 psig
48.0	315.4	321.2	326.8	332.4	337.9	343.2	348.5
50.0	313.6	319.4	325.1	330.6	336.1	341.4	346.6
52.0	311.9	317.7	323.3	328.8	334.3	339.6	344.8
54.0	310.2	315.9	321.6	327.1	332.5	337.8	343.0
56.0	308.5	314.2	319.8	325.4	330.8	336.1	341.3
58.0	306.9	312.6	318.1	323.6	329.0	334.3	339.5
60.0	305.2	310.9	316.5	321.9	327.3	332.6	337.8
62.0	303.6	309.2	314.8	320.3	325.6	330.9	336.1
64.0	302.0	307.6	313.2	318.6	324.0	329.2	334.4
66.0	300.4	306.0	311.5	317.0	322.3	327.6	332.7
68.0	298.8	304.4	309.9	315.3	320.7	325.9	331.0
70.0	297.3	302.8	308.3	313.7	319.1	324.3	329.4
72.0	295.7	301.3	306.8	312.2	317.5	322.7	327.8
74.0	294.2	299.8	305.2	310.6	315.9	321.1	326.2
76.0	292.7	298.2	303.7	309.0	314.3	319.5	324.6
78.0	291.2	296.7	302.2	307.5	312.8	317.9	323.0
80.0	289.8	295.3	300.7	306.0	311.2	316.4	321.4
82.0	288.3	293.8	299.2	304.5	309.7	314.8	319.9
84.0	286.9	292.3	297.7	303.0	308.2	313.3	318.4
86.0	285.4	290.9	296.2	301.5	306.7	311.8	316.9
88.0	284.0	289.5	294.8	300.1	305.2	310.3	315.4
90.0	282.7	288.1	293.4	298.6	303.8	308.9	313.9
92.0	281.3	286.7	292.0	297.2	302.4	307.4	312.4
94.0	279.9	285.3	290.6	295.8	300.9	306.0	311.0
96.0	278.6	283.9	289.2	294.4	299.5	304.6	309.5
98.0	277.3	282.6	287.8	293.0	298.1	303.1	308.1
100.0	275.9	281.3	286.5	291.7	296.7	301.8	306.7
102.0	274.6	279.9	285.2	290.3	295.4	300.4	305.3
104.0	273.4	278.6	283.8	289.0	294.0	299.0	303.9
106.0	272.1	277.3	282.5	287.6	292.7	297.7	302.5
108.0	270.8	276.1	281.2	286.3	291.4	296.3	301.2
110.0	269.6	274.8	280.0	285.0	290.0	295.0	299.9
112.0	268.4	273.6	278.7	283.8	288.7	293.7	298.5
114.0	267.1	272.3	277.4	282.5	287.5	292.4	297.2
116.0	265.9	271.1	276.2	281.2	286.2	291.1	295.9
118.0	264.7	269.9	275.0	280.0	284.9	289.8	294.6
120.0	263.5	268.7	273.7	278.7	283.7	288.5	293.3
122.0	262.4	267.5	272.5	277.5	282.4	287.3	292.1
124.0	261.2	266.3	271.3	276.3	281.2	286.1	290.8
126.0	260.1	265.2	270.2	275.1	280.0	284.8	289.6
128.0	258.9	264.0	269.0	273.9	278.8	283.6	288.4
130.0	257.8	262.9	267.8	272.8	277.6	282.4	287.1

Table 11-2. Argon Contents Table (SCF/cu ft) - Continued

°F	5000 psig	5100 psig	5200 psig	5300 psig	5400 psig	5500 psig	5600 psig
-40.0	456.1	461.0	465.7	470.3	474.8	479.1	483.4
-38.0	453.3	458.1	462.9	467.5	472.0	476.4	480.7
-36.0	450.5	455.4	460.1	464.8	469.3	473.7	478.0
-34.0	447.7	452.6	457.4	462.0	466.6	471.0	475.3
-32.0	444.9	449.8	454.6	459.3	463.9	468.3	472.7
-30.0	442.2	447.1	451.9	456.6	461.2	465.7	470.0
-28.0	439.4	444.4	449.3	454.0	458.6	463.0	467.4
-26.0	436.8	441.7	446.6	451.3	455.9	460.4	464.8
-24.0	434.1	439.1	444.0	448.7	453.3	457.8	462.2
-22.0	431.4	436.5	441.3	446.1	450.7	455.3	459.7
-20.0	428.8	433.8	438.7	443.5	448.2	452.7	457.1
-18.0	426.2	431.3	436.2	441.0	445.6	450.2	454.6
-16.0	423.7	428.7	433.6	438.4	443.1	447.7	452.1
-14.0	421.1	426.2	431.1	435.9	440.6	445.2	449.6
-12.0	418.6	423.7	428.6	433.4	438.1	442.7	447.2
-10.0	416.1	421.2	426.1	430.9	435.6	440.2	444.7
-8.0	413.6	418.7	423.7	428.5	433.2	437.8	442.3
-6.0	411.2	416.2	421.2	426.1	430.8	435.4	439.9
-4.0	408.7	413.8	418.8	423.7	428.4	433.0	437.5
-2.0	406.3	411.4	416.4	421.3	426.0	430.7	435.2
0.0	404.0	409.1	414.0	418.9	423.7	428.3	432.8
2.0	401.6	406.7	411.7	416.6	421.3	426.0	430.5
4.0	399.3	404.4	409.4	414.2	419.0	423.7	428.2
6.0	397.0	402.1	407.1	412.0	416.7	421.4	425.9
8.0	394.7	399.8	404.8	409.7	414.5	419.1	423.7
10.0	392.4	397.5	402.5	407.4	412.2	416.9	421.4
12.0	390.2	395.3	400.3	405.2	410.0	414.6	419.2
14.0	388.0	393.1	398.1	403.0	407.8	412.4	417.0
16.0	385.8	390.9	395.9	400.8	405.6	410.3	414.8
18.0	383.6	388.7	393.7	398.6	403.4	408.1	412.7
20.0	381.4	386.6	391.6	396.5	401.3	405.9	410.5
22.0	379.3	384.4	389.4	394.3	399.1	403.8	408.4
24.0	377.2	382.3	387.3	392.2	397.0	401.7	406.3
26.0	375.1	380.2	385.2	390.1	394.9	399.6	404.2
28.0	373.1	378.2	383.2	388.1	392.9	397.6	402.2
30.0	371.0	376.1	381.1	386.0	390.8	395.5	400.1
32.0	369.0	374.1	379.1	384.0	388.8	393.5	398.1
34.0	367.0	372.1	377.1	382.0	386.8	391.5	396.1
36.0	365.0	370.1	375.1	380.0	384.8	389.5	394.1
38.0	363.1	368.2	373.2	378.0	382.8	387.5	392.1
40.0	361.2	366.2	371.2	376.1	380.9	385.6	390.1
42.0	359.2	364.3	369.3	374.2	378.9	383.6	388.2
44.0	357.3	362.4	367.4	372.2	377.0	381.7	386.3
46.0	355.5	360.5	365.5	370.4	375.1	379.8	384.4

Table 11-2. Argon Contents Table (SCF/cu ft) - Continued

°F	5000 psig	5100 psig	5200 psig	5300 psig	5400 psig	5500 psig	5600 psig
48.0	353.6	358.7	363.6	368.5	373.2	377.9	382.5
50.0	351.8	356.8	361.8	366.6	371.4	376.1	380.6
52.0	350.0	355.0	359.9	364.8	369.5	374.2	378.8
54.0	348.2	353.2	358.1	363.0	367.7	372.4	377.0
56.0	346.4	351.4	356.3	361.2	365.9	370.6	375.1
58.0	344.6	349.6	354.6	359.4	364.1	368.8	373.3
60.0	342.9	347.9	352.8	357.6	362.4	367.0	371.6
62.0	341.2	346.2	351.1	355.9	360.6	365.2	369.8
64.0	339.5	344.4	349.3	354.1	358.9	363.5	368.0
66.0	337.8	342.7	347.6	352.4	357.1	361.8	366.3
68.0	336.1	341.1	345.9	350.7	355.4	360.1	364.6
70.0	334.4	339.4	344.3	349.0	353.7	358.4	362.9
72.0	332.8	337.7	342.6	347.4	352.1	356.7	361.2
74.0	331.2	336.1	341.0	345.7	350.4	355.0	359.5
76.0	329.6	334.5	339.3	344.1	348.8	353.4	357.9
78.0	328.0	332.9	337.7	342.5	347.2	351.7	356.3
80.0	326.4	331.3	336.1	340.9	345.5	350.1	354.6
82.0	324.9	329.8	334.6	339.3	343.9	348.5	353.0
84.0	323.3	328.2	333.0	337.7	342.4	346.9	351.4
86.0	321.8	326.7	331.5	336.2	340.8	345.4	349.8
88.0	320.3	325.1	329.9	334.6	339.3	343.8	348.3
90.0	318.8	323.6	328.4	333.1	337.7	342.3	346.7
92.0	317.3	322.2	326.9	331.6	336.2	340.7	345.2
94.0	315.0	320.7	325.4	330.1	334.7	339.2	343.7
96.0	314.4	319.2	324.0	328.6	333.2	337.7	342.2
98.0	313.0	317.8	322.5	327.1	331.7	336.2	340.7
100.0	311.5	316.3	321.0	325.7	330.3	334.8	339.2
102.0	310.1	314.9	319.6	324.2	328.8	333.3	337.7
104.0	308.7	313.5	318.2	322.8	327.4	331.9	336.3
106.0	307.4	312.1	316.8	321.4	326.0	330.4	334.8
108.0	306.0	310.7	315.4	320.0	324.5	329.0	333.4
110.0	304.6	309.4	314.0	318.6	323.1	327.6	332.0
112.0	303.3	308.0	312.7	317.2	321.8	326.2	330.6
114.0	302.0	306.7	311.3	315.9	320.4	324.8	329.2
116.0	300.7	305.4	310.0	314.5	319.0	323.5	327.8
118.0	299.4	304.0	308.7	313.2	317.7	322.1	326.4
120.0	298.1	302.7	307.3	311.9	316.3	320.8	325.1
122.0	296.8	301.4	306.0	310.6	315.0	319.4	323.8
124.0	295.5	300.2	304.7	309.3	313.7	318.1	322.4
126.0	294.3	298.9	303.5	308.0	312.4	316.8	321.1
128.0	293.0	297.7	302.2	306.7	311.1	315.5	319.8
130.0	291.8	296.4	300.9	305.4	309.8	314.2	318.5

Table 11-2. Argon Contents Table (SCF/cu ft) - Continued

°F	5700 psig	5800 psig	5900 psig	6000 psig
-40.0	487.5	491.6	495.5	499.4
-38.0	484.8	488.9	492.9	496.8
-36.0	482.2	486.3	490.3	494.2
-34.0	479.5	483.6	487.6	491.6
-32.0	476.9	481.0	485.0	489.0
-30.0	474.3	478.4	482.5	486.4
-28.0	471.7	475.8	479.9	483.9
-26.0	469.1	473.3	477.3	481.3
-24.0	466.5	470.7	474.8	478.8
-22.0	464.0	468.2	472.3	476.3
-20.0	461.5	465.7	469.8	473.8
-18.0	458.9	463.2	467.3	471.4
-16.0	456.5	460.7	464.9	468.9
-14.0	454.0	458.3	462.4	466.5
-12.0	451.6	455.8	460.0	464.1
-10.0	449.1	453.4	457.6	461.7
-8.0	446.7	451.0	455.2	459.3
-6.0	444.3	448.6	452.8	457.0
-4.0	442.0	446.3	450.5	454.6
-2.0	439.6	443.9	448.2	452.3
0.0	437.3	441.6	445.9	450.0
2.0	435.0	439.3	443.6	447.7
4.0	432.7	437.0	441.3	445.5
6.0	430.4	434.8	439.0	443.2
8.0	428.1	432.5	436.8	441.0
10.0	425.9	430.3	434.6	438.8
12.0	423.7	428.1	432.4	436.6
14.0	421.5	425.9	430.2	434.4
16.0	419.3	423.7	428.0	432.2
18.0	417.2	421.6	425.9	430.1
20.0	415.0	419.4	423.7	428.0
22.0	412.9	417.3	421.6	425.9
24.0	410.8	415.2	419.5	423.8
26.0	408.7	413.1	417.5	421.7
28.0	406.7	411.1	415.4	419.6
30.0	404.6	409.0	413.4	417.6
32.0	402.6	407.0	411.3	415.6
34.0	400.6	405.0	409.3	413.6
36.0	398.6	403.0	407.3	411.6
38.0	396.6	401.0	405.4	409.6
40.0	394.7	399.1	403.4	407.7
42.0	392.7	397.1	401.5	405.7
44.0	390.8	395.2	399.5	403.8
46.0	388.9	393.3	397.6	401.9

Table 11-2. Argon Contents Table (SCF/cu ft) - Continued

°F	5700 psig	5800 psig	5900 psig	6000 psig
48.0	387.0	391.4	395.8	400.0
50.0	385.1	389.6	393.9	398.1
52.0	383.3	387.7	392.0	396.3
54.0	381.4	385.9	390.2	394.4
56.0	379.6	384.0	388.4	392.6
58.0	377.8	382.2	386.6	390.8
60.0	376.0	380.4	384.8	389.0
62.0	374.3	378.7	383.0	387.2
64.0	372.5	376.9	381.2	385.5
66.0	370.8	375.2	379.5	383.7
68.0	369.1	373.5	377.8	382.0
70.0	367.4	371.7	376.0	380.3
72.0	365.7	370.0	374.3	378.6
74.0	364.0	368.4	372.7	376.9
76.0	362.3	366.7	371.0	375.2
78.0	360.7	365.1	369.3	373.6
80.0	359.1	363.4	367.7	371.9
82.0	357.4	361.8	366.1	370.3
84.0	355.8	360.2	364.5	368.7
86.0	354.3	358.6	362.9	367.1
88.0	352.7	357.0	361.3	365.5
90.0	351.1	355.5	359.7	363.9
92.0	349.6	353.9	358.2	362.4
94.0	348.1	352.4	356.6	360.8
96.0	346.5	350.9	355.1	359.3
98.0	345.0	349.3	353.6	357.8
100.0	343.6	347.9	352.1	356.2
102.0	342.1	346.4	350.6	354.8
104.0	340.6	344.9	349.1	353.3
106.0	339.2	343.4	347.7	351.8
108.0	337.7	342.0	346.2	350.3
110.0	336.3	340.6	344.8	348.9
112.0	334.9	339.2	343.3	347.5
114.0	333.5	337.7	341.9	346.1
116.0	332.1	336.4	340.5	344.6
118.0	330.7	335.0	339.1	343.2
120.0	329.4	333.6	337.8	341.9
122.0	328.0	332.2	336.4	340.5
124.0	326.7	330.9	335.0	339.1
126.0	325.4	329.6	333.7	337.8
128.0	324.0	328.2	332.4	336.4
130.0	322.7	326.9	331.0	335.1

Table 11-3. Nitrogen Contents Table (SCF/cu ft)

°F	100 psig	200 psig	300 psig	400 psig	500 psig	600 psig	700 psig
-40.0	9.935	18.73	27.65	36.69	45.82	55.05	64.35
-38.0	9.886	18.64	27.51	36.49	45.56	54.73	63.97
-36.0	9.837	18.54	27.36	36.29	45.31	54.41	63.59
-34.0	9.789	18.45	27.22	36.09	45.06	54.10	63.21
-32.0	9.741	18.36	27.08	35.90	44.81	53.79	62.85
-30.0	9.694	18.26	26.94	35.71	44.56	53.49	62.48
-28.0	9.647	18.17	26.80	35.52	44.32	53.19	62.12
-26.0	9.601	18.08	26.66	35.33	44.08	52.90	61.77
-24.0	9.555	17.99	26.53	35.15	43.84	52.60	61.42
-22.0	9.510	17.91	26.39	34.96	43.61	52.32	61.08
-20.0	9.465	17.82	26.26	34.78	43.38	52.03	60.74
-18.0	9.421	17.73	26.13	34.61	43.15	51.75	60.40
-16.0	9.377	17.65	26.00	34.43	42.92	51.47	60.07
-14.0	9.333	17.56	25.87	34.26	42.70	51.20	59.74
-12.0	9.290	17.48	25.75	34.08	42.48	50.93	59.42
-10.0	9.247	17.40	25.62	33.91	42.26	50.66	59.10
-8.0	9.205	17.32	25.50	33.74	42.05	50.40	58.78
-6.0	9.163	17.23	25.37	33.58	41.83	50.14	58.47
-4.0	9.121	17.15	25.25	33.41	41.62	49.88	58.17
-2.0	9.080	17.07	25.13	33.25	41.42	49.62	57.86
0.0	9.040	17.00	25.01	33.09	41.21	49.37	57.56
2.0	8.999	16.92	24.90	32.93	41.01	49.12	57.27
4.0	8.959	16.84	24.78	32.77	40.81	48.88	56.97
6.0	8.919	16.76	24.66	32.61	40.61	48.63	56.68
8.0	8.880	16.69	24.55	32.46	40.41	48.39	56.40
10.0	8.841	16.61	24.44	32.31	40.21	48.15	56.11
12.0	8.802	16.54	24.32	32.16	40.02	47.92	55.83
14.0	8.764	16.46	24.21	32.01	39.83	47.68	55.56
16.0	8.726	16.39	24.10	31.86	39.64	47.45	55.28
18.0	8.689	16.32	24.00	31.71	39.46	47.23	55.01
20.0	8.651	16.25	23.89	31.56	39.27	47.00	54.75
22.0	8.614	16.18	23.78	31.42	39.09	46.78	54.48
24.0	8.578	16.11	23.68	31.28	38.91	46.56	54.22
26.0	8.542	16.04	23.57	31.14	38.73	46.34	53.96
28.0	8.506	15.97	23.47	31.00	38.55	46.12	53.70
30.0	8.470	15.90	23.36	30.86	38.38	45.91	53.45
32.0	8.435	15.83	23.26	30.72	38.20	45.70	53.20
34.0	8.400	15.76	23.16	30.59	38.03	45.49	52.95
36.0	8.365	15.70	23.06	30.45	37.86	45.28	52.71
38.0	8.330	15.63	22.96	30.32	37.69	45.08	52.46
40.0	8.296	15.57	22.86	30.19	37.52	44.87	52.22
42.0	8.262	15.50	22.77	30.05	37.36	44.67	51.99
44.0	8.229	15.44	22.67	29.93	37.19	44.47	51.75

Table 11-3. Nitrogen Contents Table (SCF/cu ft) - Continued

°F	100 psig	200 psig	300 psig	400 psig	500 psig	600 psig	700 psig
46.0	8.195	15.37	22.58	29.80	37.03	44.27	51.52
48.0	8.162	15.31	22.48	29.67	36.87	44.08	51.29
50.0	8.129	15.25	22.39	29.54	36.71	43.89	51.06
52.0	8.097	15.18	22.29	29.42	36.55	43.69	50.83
54.0	8.065	15.12	22.20	29.30	36.40	43.50	50.61
56.0	8.033	15.06	22.11	29.17	36.24	43.32	50.39
58.0	8.001	15.00	22.02	29.05	36.09	43.13	50.17
60.0	7.969	14.94	21.93	28.93	35.94	42.95	49.95
62.0	7.938	14.88	21.84	28.81	35.79	42.76	49.74
64.0	7.907	14.82	21.75	28.69	35.64	42.58	49.52
66.0	7.877	14.76	21.67	28.58	35.49	42.40	49.31
68.0	7.846	14.71	21.58	28.46	35.34	42.23	49.10
70.0	7.816	14.65	21.49	28.34	35.20	42.05	48.89
72.0	7.786	14.59	21.41	28.23	35.05	41.88	48.69
74.0	7.756	14.53	21.32	28.12	34.91	41.70	48.49
76.0	7.727	14.48	21.24	28.00	34.77	41.53	48.28
78.0	7.697	14.42	21.16	27.89	34.63	41.36	48.08
80.0	7.668	14.37	21.07	27.78	34.49	41.19	47.89
82.0	7.639	14.31	20.99	27.67	34.35	41.03	47.69
84.0	7.611	14.26	20.91	27.56	34.22	40.86	47.50
86.0	7.582	14.20	20.83	27.46	34.08	40.70	47.30
88.0	7.554	14.15	20.75	27.35	33.95	40.54	47.11
90.0	7.526	14.10	20.67	27.24	33.81	40.38	46.92
92.0	7.498	14.04	20.59	27.14	33.68	40.22	46.74
94.0	7.471	13.99	20.51	27.04	33.55	40.06	46.55
96.0	7.443	13.94	20.44	26.93	33.42	39.90	46.37
98.0	7.416	13.89	20.36	26.83	33.29	39.75	46.18
100.0	7.389	13.84	20.28	26.73	33.17	39.59	46.00
102.0	7.362	13.79	20.21	26.63	33.04	39.44	45.82
104.0	7.336	13.73	20.13	26.53	32.91	39.29	45.65
106.0	7.309	13.68	20.06	26.43	32.79	39.14	45.47
108.0	7.283	13.64	19.99	26.33	32.67	38.99	45.29
110.0	7.257	13.59	19.91	26.23	32.54	38.84	45.12
112.0	7.231	13.54	19.84	26.14	32.42	38.69	44.95
114.0	7.206	13.49	19.77	26.04	32.30	38.55	44.78
116.0	7.180	13.44	19.70	25.94	32.18	38.40	44.61
118.0	7.155	13.39	19.62	25.85	32.06	38.26	44.44
120.0	7.130	13.34	19.55	25.76	31.94	38.12	44.27
122.0	7.105	13.30	19.48	25.66	31.83	37.98	44.11
124.0	7.080	13.25	19.41	25.57	31.71	37.84	43.95
126.0	7.056	13.20	19.35	25.48	31.60	37.70	43.78
128.0	7.032	13.16	19.28	25.39	31.48	37.56	43.62
130.0	7.007	13.11	19.21	25.30	31.37	37.43	43.46

Table 11-3. Nitrogen Contents Table (SCF/cu ft) - Continued

°F	800 psig	900 psig	1000 psig	1100 psig	1200 psig	1300 psig	1400 psig
-40.0	73.72	83.13	92.58	102.0	111.5	120.9	130.3
-38.0	73.27	82.61	91.99	101.4	110.8	120.1	129.4
-36.0	72.82	82.10	91.40	100.7	110.0	119.3	128.5
-34.0	72.38	81.59	90.83	100.1	109.3	118.5	127.7
-32.0	71.95	81.09	90.26	99.43	108.6	117.7	126.8
-30.0	71.52	80.60	89.70	98.80	107.9	117.0	126.0
-28.0	71.10	80.12	89.15	98.18	107.2	116.2	125.2
-26.0	70.69	79.64	88.61	97.58	106.5	115.5	124.3
-24.0	70.28	79.17	88.07	96.98	105.9	114.7	123.5
-22.0	69.88	78.70	87.54	96.39	105.2	114.0	122.8
-20.0	69.48	78.25	87.03	95.80	104.6	113.3	122.0
-18.0	69.09	77.79	86.51	95.23	103.9	112.6	121.2
-16.0	68.70	77.35	86.01	94.67	103.3	111.9	120.5
-14.0	68.32	76.91	85.51	94.11	102.7	111.2	119.7
-12.0	67.94	76.48	85.02	93.56	102.1	110.6	119.0
-10.0	67.57	76.05	84.54	93.02	101.5	109.9	118.3
-8.0	67.20	75.63	84.06	92.48	100.9	109.3	117.6
-6.0	66.83	75.21	83.59	91.96	100.3	108.6	116.9
-4.0	66.48	74.80	83.12	91.44	99.73	108.0	116.2
-2.0	66.12	74.39	82.66	90.93	99.16	107.4	115.5
0.0	65.77	73.99	82.21	90.42	98.60	106.8	114.9
2.0	65.43	73.60	81.76	89.92	98.05	106.2	114.2
4.0	65.09	73.21	81.32	89.43	97.51	105.6	113.6
6.0	64.75	72.82	80.89	88.94	96.97	105.0	112.9
8.0	64.42	72.44	80.46	88.46	96.44	104.4	112.3
10.0	64.09	72.06	80.03	87.99	95.92	103.8	111.7
12.0	63.76	71.69	79.61	87.52	95.40	103.2	111.1
14.0	63.44	71.32	79.20	87.06	94.89	102.7	110.4
16.0	63.12	70.96	78.79	86.60	94.39	102.1	109.8
18.0	62.81	70.60	78.39	86.15	93.89	101.6	109.3
20.0	62.50	70.25	77.99	85.71	93.40	101.1	108.7
22.0	62.19	69.90	77.59	85.27	92.92	100.5	108.1
24.0	61.89	69.55	77.20	84.83	92.44	100.0	107.5
26.0	61.59	69.21	76.82	84.40	91.97	99.49	107.0
28.0	61.29	68.87	76.44	83.98	91.50	98.98	106.4
30.0	61.00	68.53	76.06	83.56	91.04	98.47	105.9
32.0	60.71	68.20	75.69	83.15	90.58	97.98	105.3
34.0	60.42	67.88	75.32	82.74	90.13	97.48	104.8
36.0	60.13	67.55	74.95	82.33	89.68	97.00	104.3
38.0	59.85	67.23	74.59	81.93	89.24	96.52	103.7
40.0	59.57	66.91	74.24	81.54	88.81	96.04	103.2
42.0	59.30	66.60	73.89	81.15	88.38	95.57	102.7
44.0	59.03	66.29	73.54	80.76	87.95	95.11	102.2
46.0	58.76	65.98	73.19	80.38	87.53	94.65	101.7

Table 11-3. Nitrogen Contents Table (SCF/cu ft) - Continued

°F	800 psig	900 psig	1000 psig	1100 psig	1200 psig	1300 psig	1400 psig
48.0	58.49	65.68	72.85	80.00	87.11	94.19	101.2
50.0	58.23	65.38	72.52	79.62	86.70	93.74	100.7
52.0	57.96	65.08	72.18	79.25	86.30	93.30	100.3
54.0	57.71	64.79	71.85	78.89	85.89	92.86	99.78
56.0	57.45	64.50	71.52	78.53	85.49	92.43	99.31
58.0	57.20	64.21	71.20	78.17	85.10	92.00	98.85
60.0	56.95	63.92	70.88	77.81	84.71	91.57	98.39
62.0	56.70	63.64	70.57	77.46	84.33	91.15	97.93
64.0	56.45	63.36	70.25	77.11	83.94	90.74	97.48
66.0	56.21	63.09	69.94	76.77	83.57	90.32	97.04
68.0	55.97	62.81	69.63	76.43	83.19	89.92	96.60
70.0	55.73	62.54	69.33	76.09	82.82	89.51	96.16
72.0	55.49	62.27	69.03	75.76	82.46	89.12	95.73
74.0	55.25	62.01	68.73	75.43	82.09	88.72	95.30
76.0	55.02	61.74	68.44	75.10	81.74	88.33	94.88
78.0	54.79	61.48	68.14	74.78	81.38	87.94	94.46
80.0	54.56	61.22	67.85	74.46	81.03	87.56	94.05
82.0	54.34	60.97	67.57	74.14	80.68	87.18	93.64
84.0	54.11	60.71	67.28	73.83	80.34	86.81	93.23
86.0	53.89	60.46	67.00	73.52	79.99	86.43	92.83
88.0	53.67	60.21	66.72	73.21	79.66	86.07	92.44
90.0	53.46	59.96	66.45	72.90	79.32	85.70	92.04
92.0	53.24	59.72	66.17	72.60	78.99	85.34	91.65
94.0	53.03	59.48	65.90	72.30	78.66	84.98	91.27
96.0	52.81	59.24	65.64	72.00	78.34	84.63	90.88
98.0	52.60	59.00	65.37	71.71	78.01	84.28	90.51
100.0	52.39	58.76	65.11	71.42	77.69	83.93	90.13
102.0	52.19	58.53	64.84	71.13	77.38	83.59	89.76
104.0	51.98	58.30	64.59	70.84	77.06	83.25	89.39
106.0	51.78	58.07	64.33	70.56	76.75	82.91	89.03
108.0	51.58	57.84	64.08	70.28	76.45	82.58	88.67
110.0	51.38	57.62	63.82	70.00	76.14	82.25	88.31
112.0	51.18	57.39	63.57	69.72	75.84	81.92	87.95
114.0	50.99	57.17	63.33	69.45	75.54	81.59	87.60
116.0	50.79	56.95	63.08	69.18	75.24	81.27	87.26
118.0	50.60	56.73	62.84	68.91	74.95	80.95	86.91
120.0	50.41	56.52	62.60	68.64	74.66	80.63	86.57
122.0	50.22	56.30	62.36	68.38	74.37	80.32	86.23
124.0	50.03	56.09	62.12	68.12	74.08	80.01	85.89
126.0	49.84	55.88	61.88	67.86	73.80	79.70	85.56
128.0	49.66	55.67	61.65	67.60	73.52	79.39	85.23
130.0	49.47	55.46	61.42	67.35	73.24	79.09	84.91

Table 11-3. Nitrogen Contents Table (SCF/cu ft) - Continued

°F	1500 psig	1600 psig	1700 psig	1800 psig	1900 psig	2000 psig	2100 psig
-40.0	139.6	148.9	158.0	167.1	176.0	184.8	193.4
-38.0	138.7	147.8	156.9	165.9	174.7	183.4	192.0
-36.0	137.7	146.8	155.8	164.7	173.5	182.1	190.6
-34.0	136.8	145.8	154.7	163.6	172.3	180.9	189.3
-32.0	135.9	144.8	153.7	162.4	171.1	179.6	188.0
-30.0	134.9	143.8	152.6	161.3	169.9	178.4	186.7
-28.0	134.1	142.9	151.6	160.2	168.8	177.2	185.4
-26.0	133.2	141.9	150.6	159.2	167.6	176.0	184.2
-24.0	132.3	141.0	149.6	158.1	166.5	174.8	182.9
-22.0	131.5	140.1	148.6	157.1	165.4	173.6	181.7
-20.0	130.6	139.2	147.7	156.1	164.3	172.5	180.5
-18.0	129.8	138.3	146.7	155.0	163.3	171.4	179.4
-16.0	129.0	137.4	145.8	154.1	162.2	170.3	178.2
-14.0	128.2	136.6	144.9	153.1	161.2	169.2	177.1
-12.0	127.4	135.7	144.0	152.1	160.2	168.1	176.0
-10.0	126.6	134.9	143.1	151.2	159.2	167.1	174.9
-8.0	125.9	134.1	142.2	150.2	158.2	166.0	173.8
-6.0	125.1	133.3	141.3	149.3	157.2	165.0	172.7
-4.0	124.4	132.5	140.5	148.4	156.3	164.0	171.6
-2.0	123.6	131.7	139.7	147.5	155.3	163.0	170.6
0.0	122.9	130.9	138.8	146.7	154.4	162.0	169.6
2.0	122.2	130.1	138.0	145.8	153.5	161.1	168.6
4.0	121.5	129.4	137.2	144.9	152.6	160.1	167.6
6.0	120.8	128.7	136.4	144.1	151.7	159.2	166.6
8.0	120.1	127.9	135.6	143.3	150.8	158.3	165.6
10.0	119.5	127.2	134.9	142.5	150.0	157.4	164.7
12.0	118.8	126.5	134.1	141.7	149.1	156.5	163.8
14.0	118.1	125.8	133.4	140.9	148.3	155.6	162.8
16.0	117.5	125.1	132.6	140.1	147.4	154.7	161.9
18.0	116.9	124.4	131.9	139.3	146.6	153.9	161.0
20.0	116.2	123.7	131.2	138.5	145.8	153.0	160.1
22.0	115.6	123.1	130.5	137.8	145.0	152.2	159.2
24.0	115.0	122.4	129.8	137.0	144.2	151.4	158.4
26.0	114.4	121.8	129.1	136.3	143.5	150.5	157.5
28.0	113.8	121.1	128.4	135.6	142.7	149.7	156.7
30.0	113.2	120.5	127.7	134.9	141.9	148.9	155.9
32.0	112.6	119.9	127.1	134.2	141.2	148.2	155.0
34.0	112.1	119.3	126.4	133.5	140.5	147.4	154.2
36.0	111.5	118.6	125.7	132.8	139.7	146.6	153.4
38.0	110.9	118.0	125.1	132.1	139.0	145.9	152.6
40.0	110.4	117.5	124.5	131.4	138.3	145.1	151.8
42.0	109.8	116.9	123.8	130.8	137.6	144.4	151.1
44.0	109.3	116.3	123.2	130.1	136.9	143.7	150.3
46.0	108.7	115.7	122.6	129.5	136.2	142.9	149.6

Table 11-3. Nitrogen Contents Table (SCF/cu ft) - Continued

°F	1500 psig	1600 psig	1700 psig	1800 psig	1900 psig	2000 psig	2100 psig
48.0	108.2	115.1	122.0	128.8	135.6	142.2	148.8
50.0	107.7	114.6	121.4	128.2	134.9	141.5	148.1
52.0	107.2	114.0	120.8	127.6	134.2	140.8	147.3
54.0	106.7	113.5	120.2	126.9	133.6	140.1	146.6
56.0	106.2	112.9	119.7	126.3	132.9	139.5	145.9
58.0	105.7	112.4	119.1	125.7	132.3	138.8	145.2
60.0	105.2	111.9	118.5	125.1	131.7	138.1	144.5
62.0	104.7	111.4	118.0	124.5	131.0	137.5	143.8
64.0	104.2	110.8	117.4	124.0	130.4	136.8	143.2
66.0	103.7	110.3	116.9	123.4	129.8	136.2	142.5
68.0	103.2	109.8	116.3	122.8	129.2	135.5	141.8
70.0	102.8	109.3	115.8	122.2	128.6	134.9	141.2
72.0	102.3	108.8	115.3	121.7	128.0	134.3	140.5
74.0	101.8	108.3	114.8	121.1	127.4	133.7	139.9
76.0	101.4	107.8	114.2	120.6	126.9	133.1	139.2
78.0	100.9	107.4	113.7	120.0	126.3	132.5	138.6
80.0	100.5	106.9	113.2	119.5	125.7	131.9	138.0
82.0	100.1	106.4	112.7	119.0	125.2	131.3	137.4
84.0	99.62	106.0	112.2	118.5	124.6	130.7	136.8
86.0	99.19	105.5	111.7	117.9	124.1	130.1	136.1
88.0	98.76	105.0	111.3	117.4	123.5	129.6	135.6
90.0	98.34	104.6	110.8	116.9	123.0	129.0	135.0
92.0	97.92	104.1	110.3	116.4	122.5	128.4	134.4
94.0	97.50	103.7	109.8	115.9	121.9	127.9	133.8
96.0	97.09	103.3	109.4	115.4	121.4	127.4	133.2
98.0	96.69	102.8	108.9	114.9	120.9	126.8	132.7
100.0	96.28	102.4	108.4	114.4	120.4	126.3	132.1
102.0	95.89	102.0	108.0	114.0	119.9	125.7	131.5
104.0	95.49	101.5	107.5	113.5	119.4	125.2	131.0
106.0	95.10	101.1	107.1	113.0	118.9	124.7	130.4
108.0	94.71	100.7	106.7	112.6	118.4	124.2	129.9
110.0	94.33	100.3	106.2	112.1	117.9	123.7	129.4
112.0	93.95	99.89	105.8	111.6	117.4	123.2	128.8
114.0	93.57	99.49	105.4	111.2	117.0	122.7	128.3
116.0	93.20	99.09	104.9	110.7	116.5	122.2	127.8
118.0	92.83	98.70	104.5	110.3	116.0	121.7	127.3
120.0	92.46	98.31	104.1	109.9	115.5	121.2	126.8
122.0	92.10	97.92	103.7	109.4	115.1	120.7	126.3
124.0	91.74	97.54	103.3	109.0	114.6	120.2	125.8
126.0	91.38	97.15	102.9	108.6	114.2	119.8	125.3
128.0	91.03	96.78	102.5	108.1	113.7	119.3	124.8
130.0	90.68	96.40	102.1	107.7	113.3	118.8	124.3

Table 11-3. Nitrogen Contents Table (SCF/cu ft) - Continued

°F	2200 psig	2300 psig	2400 psig	2500 psig	2600 psig	2700 psig	2800 psig
-40.0	201.8	210.1	218.2	226.1	233.8	241.3	248.7
-38.0	200.4	208.6	216.6	224.5	232.2	239.7	247.0
-36.0	199.0	207.1	215.1	222.9	230.6	238.0	245.3
-34.0	197.6	205.7	213.6	221.4	229.0	236.4	243.6
-32.0	196.2	204.3	212.2	219.9	227.4	234.8	242.0
-30.0	194.8	202.9	210.7	218.4	225.9	233.2	240.4
-28.0	193.5	201.5	209.3	216.9	224.4	231.7	238.8
-26.0	192.2	200.1	207.9	215.5	222.9	230.2	237.3
-24.0	190.9	198.8	206.5	214.1	221.4	228.7	235.7
-22.0	189.7	197.5	205.1	212.7	220.0	227.2	234.2
-20.0	188.4	196.2	203.8	211.3	218.6	225.7	232.7
-18.0	187.2	194.9	202.5	209.9	217.2	224.3	231.3
-16.0	186.0	193.7	201.2	208.6	215.8	222.9	229.8
-14.0	184.8	192.4	199.9	207.3	214.5	221.5	228.4
-12.0	183.7	191.2	198.7	206.0	213.1	220.1	227.0
-10.0	182.5	190.0	197.4	204.7	211.8	218.8	225.6
-8.0	181.4	188.9	196.2	203.4	210.5	217.5	224.2
-6.0	180.3	187.7	195.0	202.2	209.2	216.1	222.9
-4.0	179.2	186.6	193.8	201.0	208.0	214.8	221.6
-2.0	178.1	185.4	192.7	199.8	206.7	213.6	220.3
0.0	177.0	184.3	191.5	198.6	205.5	212.3	219.0
2.0	176.0	183.2	190.4	197.4	204.3	211.1	217.7
4.0	174.9	182.2	189.3	196.2	203.1	209.8	216.4
6.0	173.9	181.1	188.2	195.1	201.9	208.6	215.2
8.0	172.9	180.0	187.1	194.0	200.8	207.4	214.0
10.0	171.9	179.0	186.0	192.9	199.6	206.3	212.8
12.0	170.9	178.0	184.9	191.8	198.5	205.1	211.6
14.0	170.0	177.0	183.9	190.7	197.4	204.0	210.4
16.0	169.0	176.0	182.9	189.6	196.3	202.8	209.2
18.0	168.1	175.0	181.8	188.6	195.2	201.7	208.1
20.0	167.1	174.0	180.8	187.5	194.1	200.6	207.0
22.0	166.2	173.1	179.9	186.5	193.1	199.5	205.8
24.0	165.3	172.1	178.9	185.5	192.0	198.4	204.7
26.0	164.4	171.2	177.9	184.5	191.0	197.4	203.7
28.0	163.5	170.3	177.0	183.5	190.0	196.3	202.6
30.0	162.7	169.4	176.0	182.6	189.0	195.3	201.5
32.0	161.8	168.5	175.1	181.6	188.0	194.3	200.5
34.0	161.0	167.6	174.2	180.6	187.0	193.3	199.4
36.0	160.1	166.7	173.3	179.7	186.0	192.3	198.4
38.0	159.3	165.9	172.4	178.8	185.1	191.3	197.4
40.0	158.5	165.0	171.5	177.9	184.1	190.3	196.4
42.0	157.7	164.2	170.6	177.0	183.2	189.4	195.4
44.0	156.9	163.4	169.8	176.1	182.3	188.4	194.4
46.0	156.1	162.5	168.9	175.2	181.4	187.5	193.5

Table 11-3. Nitrogen Contents Table (SCF/cu ft) - Continued

°F	2200 psig	2300 psig	2400 psig	2500 psig	2600 psig	2700 psig	2800 psig
48.0	155.3	161.7	168.1	174.3	180.5	186.5	192.5
50.0	154.5	160.9	167.2	173.5	179.6	185.6	191.6
52.0	153.8	160.1	166.4	172.6	178.7	184.7	190.6
54.0	153.0	159.4	165.6	171.8	177.8	183.8	189.7
56.0	152.3	158.6	164.8	170.9	177.0	182.9	188.8
58.0	151.6	157.8	164.0	170.1	176.1	182.0	187.9
60.0	150.8	157.1	163.2	169.3	175.3	181.2	187.0
62.0	150.1	156.3	162.4	168.5	174.5	180.3	186.1
64.0	149.4	155.6	161.7	167.7	173.6	179.5	185.2
66.0	148.7	154.9	160.9	166.9	172.8	178.6	184.4
68.0	148.0	154.1	160.2	166.1	172.0	177.8	183.5
70.0	147.3	153.4	159.4	165.4	171.2	177.0	182.7
72.0	146.6	152.7	158.7	164.6	170.4	176.2	181.8
74.0	146.0	152.0	158.0	163.8	169.7	175.4	181.0
76.0	145.3	151.3	157.2	163.1	168.9	174.6	180.2
78.0	144.7	150.6	156.5	162.4	168.1	173.8	179.4
80.0	144.0	150.0	155.8	161.6	167.4	173.0	178.6
82.0	143.4	149.3	155.1	160.9	166.6	172.3	177.8
84.0	142.7	148.6	154.4	160.2	165.9	171.5	177.0
86.0	142.1	148.0	153.8	159.5	165.2	170.7	176.2
88.0	141.5	147.3	153.1	158.8	164.4	170.0	175.5
90.0	140.9	146.7	152.4	158.1	163.7	169.3	174.7
92.0	140.2	146.0	151.8	157.4	163.0	168.5	174.0
94.0	139.6	145.4	151.1	156.7	162.3	167.8	173.2
96.0	139.0	144.8	150.5	156.1	161.6	167.1	172.5
98.0	138.4	144.2	149.8	155.4	160.9	166.4	171.7
100.0	137.9	143.6	149.2	154.8	160.2	165.7	171.0
102.0	137.3	143.0	148.6	154.1	159.6	165.0	170.3
104.0	136.7	142.4	147.9	153.5	158.9	164.3	169.6
106.0	136.1	141.8	147.3	152.8	158.2	163.6	168.9
108.0	135.6	141.2	146.7	152.2	157.6	162.9	168.2
110.0	135.0	140.6	146.1	151.6	156.9	162.3	167.5
112.0	134.5	140.0	145.5	150.9	156.3	161.6	166.8
114.0	133.9	139.4	144.9	150.3	155.7	160.9	166.2
116.0	133.4	138.9	144.3	149.7	155.0	160.3	165.5
118.0	132.8	138.3	143.7	149.1	154.4	159.7	164.8
120.0	132.3	137.8	143.2	148.5	153.8	159.0	164.2
122.0	131.8	137.2	142.6	147.9	153.2	158.4	163.5
124.0	131.2	136.7	142.0	147.3	152.6	157.8	162.9
126.0	130.7	136.1	141.5	146.8	152.0	157.1	162.2
128.0	130.2	135.6	140.9	146.2	151.4	156.5	161.6
130.0	129.7	135.1	140.4	145.6	150.8	155.9	161.0

Table 11-3. Nitrogen Contents Table (SCF/cu ft) - Continued

°F	2900 psig	3000 psig	3100 psig	3200 psig	3300 psig	3400 psig	3500 psig
-40.0	255.8	262.7	269.5	276.1	282.5	288.7	294.7
-38.0	254.1	261.0	267.7	274.3	280.6	286.9	292.9
-36.0	252.4	259.2	266.0	272.5	278.9	285.0	291.1
-34.0	250.7	257.5	264.2	270.7	277.1	283.3	289.3
-32.0	249.0	255.9	262.5	269.0	275.3	281.5	287.5
-30.0	247.4	254.2	260.8	267.3	273.6	279.8	285.7
-28.0	245.8	252.6	259.2	265.6	271.9	278.0	284.0
-26.0	244.2	250.9	257.5	264.0	270.2	276.3	282.3
-24.0	242.6	249.4	255.9	262.3	268.6	274.7	280.6
-22.0	241.1	247.8	254.3	260.7	266.9	273.0	278.9
-20.0	239.6	246.2	252.8	259.1	265.3	271.4	277.3
-18.0	238.1	244.7	251.2	257.6	263.7	269.8	275.7
-16.0	236.6	243.2	249.7	256.0	262.2	268.2	274.1
-14.0	235.1	241.7	248.2	254.5	260.6	266.6	272.5
-12.0	233.7	240.3	246.7	253.0	259.1	265.1	270.9
-10.0	232.3	238.8	245.2	251.5	257.6	263.5	269.4
-8.0	230.9	237.4	243.8	250.0	256.1	262.0	267.8
-6.0	229.5	236.0	242.3	248.5	254.6	260.5	266.3
-4.0	228.2	234.6	240.9	247.1	253.1	259.0	264.8
-2.0	226.8	233.3	239.5	245.7	251.7	257.6	263.3
0.0	225.5	231.9	238.2	244.3	250.3	256.2	261.9
2.0	224.2	230.6	236.8	242.9	248.9	254.7	260.5
4.0	222.9	229.3	235.5	241.6	247.5	253.3	259.0
6.0	221.6	228.0	234.1	240.2	246.1	251.9	257.6
8.0	220.4	226.7	232.8	238.9	244.8	250.6	256.2
10.0	219.2	225.4	231.6	237.6	243.5	249.2	254.9
12.0	217.9	224.2	230.3	236.3	242.1	247.9	253.5
14.0	216.7	222.9	229.0	235.0	240.8	246.6	252.2
16.0	215.5	221.7	227.8	233.7	239.6	245.3	250.8
18.0	214.4	220.5	226.6	232.5	238.3	244.0	249.5
20.0	213.2	219.3	225.3	231.2	237.0	242.7	248.2
22.0	212.1	218.2	224.2	230.0	235.8	241.4	247.0
24.0	210.9	217.0	223.0	228.8	234.6	240.2	245.7
26.0	209.8	215.9	221.8	227.6	233.3	239.0	244.5
28.0	208.7	214.7	220.6	226.5	232.2	237.7	243.2
30.0	207.6	213.6	219.5	225.3	231.0	236.5	242.0
32.0	206.5	212.5	218.4	224.1	229.8	235.3	240.8
34.0	205.5	211.4	217.3	223.0	228.6	234.2	239.6
36.0	204.4	210.4	216.2	221.9	227.5	233.0	238.4
38.0	203.4	209.3	215.1	220.8	226.4	231.9	237.2
40.0	202.4	208.2	214.0	219.7	225.2	230.7	236.1
42.0	201.3	207.2	212.9	218.6	224.1	229.6	234.9
44.0	200.3	206.2	211.9	217.5	223.1	228.5	233.8
46.0	199.4	205.2	210.9	216.5	222.0	227.4	232.7

Table 11-3. Nitrogen Contents Table (SCF/cu ft) - Continued

°F	2900 psig	3000 psig	3100 psig	3200 psig	3300 psig	3400 psig	3500 psig
48.0	198.4	204.1	209.8	215.4	220.9	226.3	231.6
50.0	197.4	203.2	208.8	214.4	219.8	225.2	230.5
52.0	196.4	202.2	207.8	213.4	218.8	224.2	229.4
54.0	195.5	201.2	206.8	212.3	217.8	223.1	228.3
56.0	194.6	200.2	205.8	211.3	216.7	222.1	227.3
58.0	193.6	199.3	204.9	210.3	215.7	221.0	226.2
60.0	192.7	198.4	203.9	209.4	214.7	220.0	225.2
62.0	191.8	197.4	203.0	208.4	213.7	219.0	224.2
64.0	190.9	196.5	202.0	207.4	212.8	218.0	223.2
66.0	190.0	195.6	201.1	206.5	211.8	217.0	222.1
68.0	189.2	194.7	200.2	205.5	210.8	216.0	221.2
70.0	188.3	193.8	199.3	204.6	209.9	215.1	220.2
72.0	187.4	192.9	198.4	203.7	208.9	214.1	219.2
74.0	186.6	192.1	197.5	202.8	208.0	213.2	218.2
76.0	185.7	191.2	196.6	201.9	207.1	212.2	217.3
78.0	184.9	190.3	195.7	201.0	206.2	211.3	216.3
80.0	184.1	189.5	194.8	200.1	205.3	210.4	215.4
82.0	183.3	188.7	194.0	199.2	204.4	209.5	214.5
84.0	182.5	187.8	193.1	198.4	203.5	208.6	213.5
86.0	181.7	187.0	192.3	197.5	202.6	207.7	212.6
88.0	180.9	186.2	191.5	196.7	201.8	206.8	211.7
90.0	180.1	185.4	190.7	195.8	200.9	205.9	210.8
92.0	179.3	184.6	189.8	195.0	200.0	205.0	210.0
94.0	178.6	183.8	189.0	194.2	199.2	204.2	209.1
96.0	177.8	183.1	188.2	193.3	198.4	203.3	208.2
98.0	177.1	182.3	187.4	192.5	197.5	202.5	207.4
100.0	176.3	181.5	186.7	191.7	196.7	201.6	206.5
102.0	175.6	180.8	185.9	190.9	195.9	200.8	205.7
104.0	174.8	180.0	185.1	190.2	195.1	200.0	204.8
106.0	174.1	179.3	184.4	189.4	194.3	199.2	204.0
108.0	173.4	178.5	183.6	188.6	193.5	198.4	203.2
110.0	172.7	177.8	182.9	187.8	192.8	197.6	202.4
112.0	172.0	177.1	182.1	187.1	192.0	196.8	201.6
114.0	171.3	176.4	181.4	186.3	191.2	196.0	200.8
116.0	170.6	175.7	180.7	185.6	190.5	195.2	200.0
118.0	169.9	175.0	179.9	184.9	189.7	194.5	199.2
120.0	169.3	174.3	179.2	184.1	189.0	193.7	198.4
122.0	168.6	173.6	178.5	183.4	188.2	193.0	197.6
124.0	167.9	172.9	177.8	182.7	187.5	192.2	196.9
126.0	167.3	172.2	177.1	182.0	186.8	191.5	196.1
128.0	166.6	171.6	176.5	181.3	186.0	190.7	195.4
130.0	166.0	170.9	175.8	180.6	185.3	190.0	194.6

Table 11-3. Nitrogen Contents Table (SCF/cu ft) - Continued

°F	3600 psig	3700 psig	3800 psig	3900 psig	4000 psig	4100 psig	4200 psig
-40.0	300.6	306.3	311.9	317.3	322.6	327.7	332.7
-38.0	298.8	304.5	310.0	315.4	320.7	325.8	330.8
-36.0	296.9	302.6	308.2	313.6	318.8	324.0	328.9
-34.0	295.1	300.8	306.3	311.7	317.0	322.1	327.1
-32.0	293.3	299.0	304.5	309.9	315.2	320.3	325.3
-30.0	291.6	297.2	302.8	308.1	313.4	318.5	323.5
-28.0	289.8	295.5	301.0	306.4	311.6	316.7	321.7
-26.0	288.1	293.7	299.2	304.6	309.8	314.9	319.9
-24.0	286.4	292.0	297.5	302.9	308.1	313.2	318.2
-22.0	284.7	290.3	295.8	301.2	306.4	311.5	316.4
-20.0	283.0	288.7	294.1	299.5	304.7	309.8	314.7
-18.0	281.4	287.0	292.5	297.8	303.0	308.1	313.0
-16.0	279.8	285.4	290.8	296.2	301.3	306.4	311.4
-14.0	278.2	283.8	289.2	294.5	299.7	304.8	309.7
-12.0	276.6	282.2	287.6	292.9	298.1	303.1	308.1
-10.0	275.0	280.6	286.0	291.3	296.5	301.5	306.5
-8.0	273.5	279.0	284.4	289.7	294.9	299.9	304.9
-6.0	272.0	277.5	282.9	288.2	293.3	298.3	303.3
-4.0	270.5	276.0	281.4	286.6	291.8	296.8	301.7
-2.0	269.0	274.5	279.8	285.1	290.2	295.2	300.1
0.0	267.5	273.0	278.3	283.6	288.7	293.7	298.6
2.0	266.0	271.5	276.9	282.1	287.2	292.2	297.1
4.0	264.6	270.1	275.4	280.6	285.7	290.7	295.6
6.0	263.2	268.6	273.9	279.1	284.2	289.2	294.1
8.0	261.8	267.2	272.5	277.7	282.8	287.7	292.6
10.0	260.4	265.8	271.1	276.3	281.3	286.3	291.1
12.0	259.0	264.4	269.7	274.9	279.9	284.9	289.7
14.0	257.7	263.0	268.3	273.5	278.5	283.4	288.3
16.0	256.3	261.7	266.9	272.1	277.1	282.0	286.9
18.0	255.0	260.3	265.6	270.7	275.7	280.6	285.5
20.0	253.7	259.0	264.2	269.4	274.4	279.3	284.1
22.0	252.4	257.7	262.9	268.0	273.0	277.9	282.7
24.0	251.1	256.4	261.6	266.7	271.7	276.6	281.3
26.0	249.8	255.1	260.3	265.4	270.4	275.2	280.0
28.0	248.6	253.9	259.0	264.1	269.0	273.9	278.7
30.0	247.4	252.6	257.8	262.8	267.7	272.6	277.4
32.0	246.1	251.4	256.5	261.5	266.5	271.3	276.1
34.0	244.9	250.1	255.3	260.3	265.2	270.0	274.8
36.0	243.7	248.9	254.0	259.0	263.9	268.8	273.5
38.0	242.5	247.7	252.8	257.8	262.7	267.5	272.2
40.0	241.4	246.5	251.6	256.6	261.5	266.3	271.0
42.0	240.2	245.4	250.4	255.4	260.3	265.0	269.7
44.0	239.1	244.2	249.2	254.2	259.0	263.8	268.5
46.0	237.9	243.0	248.1	253.0	257.9	262.6	267.3

Table 11-3. Nitrogen Contents Table (SCF/cu ft) - Continued

°F	3600 psig	3700 psig	3800 psig	3900 psig	4000 psig	4100 psig	4200 psig
48.0	236.8	241.9	246.9	251.8	256.7	261.4	266.1
50.0	235.7	240.8	245.8	250.7	255.5	260.2	264.9
52.0	234.6	239.7	244.6	249.5	254.4	259.1	263.7
54.0	233.5	238.6	243.5	248.4	253.2	257.9	262.5
56.0	232.4	237.5	242.4	247.3	252.1	256.8	261.4
58.0	231.4	236.4	241.3	246.2	250.9	255.6	260.2
60.0	230.3	235.3	240.2	245.1	249.8	254.5	259.1
62.0	229.3	234.3	239.2	244.0	248.7	253.4	258.0
64.0	228.2	233.2	238.1	242.9	247.6	252.3	256.9
66.0	227.2	232.2	237.0	241.8	246.6	251.2	255.8
68.0	226.2	231.1	236.0	240.8	245.5	250.1	254.7
70.0	225.2	230.1	235.0	239.7	244.4	249.0	253.6
72.0	224.2	229.1	234.0	238.7	243.4	248.0	252.5
74.0	223.2	228.1	232.9	237.7	242.3	246.9	251.4
76.0	222.2	227.1	231.9	236.7	241.3	245.9	250.4
78.0	221.3	226.1	230.9	235.7	240.3	244.9	249.3
80.0	220.3	225.2	230.0	234.7	239.3	243.8	248.3
82.0	219.4	224.2	229.0	233.7	238.3	242.8	247.3
84.0	218.4	223.3	228.0	232.7	237.3	241.8	246.3
86.0	217.5	222.3	227.1	231.7	236.3	240.8	245.3
88.0	216.6	221.4	226.1	230.8	235.3	239.8	244.3
90.0	215.7	220.5	225.2	229.8	234.4	238.9	243.3
92.0	214.8	219.6	224.3	228.9	233.4	237.9	242.3
94.0	213.9	218.7	223.3	227.9	232.5	236.9	241.3
96.0	213.0	217.8	222.4	227.0	231.5	236.0	240.4
98.0	212.1	216.9	221.5	226.1	230.6	235.1	239.4
100.0	211.3	216.0	220.6	225.2	229.7	234.1	238.5
102.0	210.4	215.1	219.7	224.3	228.8	233.2	237.5
104.0	209.6	214.3	218.9	223.4	227.9	232.3	236.6
106.0	208.7	213.4	218.0	222.5	227.0	231.4	235.7
108.0	207.9	212.5	217.1	221.6	226.1	230.5	234.8
110.0	207.1	211.7	216.3	220.8	225.2	229.6	233.9
112.0	206.2	210.9	215.4	219.9	224.3	228.7	233.0
114.0	205.4	210.0	214.6	219.1	223.5	227.8	232.1
116.0	204.6	209.2	213.8	218.2	222.6	226.9	231.2
118.0	203.8	208.4	212.9	217.4	221.8	226.1	230.3
120.0	203.0	207.6	212.1	216.5	220.9	225.2	229.5
122.0	202.3	206.8	211.3	215.7	220.1	224.4	228.6
124.0	201.5	206.0	210.5	214.9	219.3	223.5	227.8
126.0	200.7	205.2	209.7	214.1	218.4	222.7	226.9
128.0	199.9	204.5	208.9	213.3	217.6	221.9	226.1
130.0	199.2	203.7	208.1	212.5	216.8	221.1	225.3

Table 11-3. Nitrogen Contents Table (SCF/cu ft) - Continued

°F	4300 psig	4400 psig	4500 psig	4600 psig	4700 psig	4800 psig	4900 psig
-40.0	337.6	342.3	346.9	351.4	355.8	360.1	364.3
-38.0	335.7	340.4	345.0	349.5	353.9	358.2	362.4
-36.0	333.8	338.5	343.2	347.7	352.1	356.4	360.6
-34.0	332.0	336.7	341.3	345.8	350.2	354.5	358.7
-32.0	330.1	334.9	339.5	344.0	348.4	352.7	356.9
-30.0	328.3	333.1	337.7	342.2	346.6	350.9	355.1
-28.0	326.5	331.3	335.9	340.4	344.8	349.1	353.3
-26.0	324.8	329.5	334.1	338.6	343.0	347.3	351.6
-24.0	323.0	327.8	332.4	336.9	341.3	345.6	349.8
-22.0	321.3	326.0	330.6	335.2	339.6	343.9	348.1
-20.0	319.6	324.3	328.9	333.4	337.8	342.1	346.3
-18.0	317.9	322.6	327.2	331.7	336.1	340.4	344.6
-16.0	316.2	320.9	325.5	330.0	334.4	338.8	343.0
-14.0	314.5	319.3	323.9	328.4	332.8	337.1	341.3
-12.0	312.9	317.6	322.2	326.7	331.1	335.4	339.6
-10.0	311.3	316.0	320.6	325.1	329.5	333.8	338.0
-8.0	309.7	314.4	319.0	323.5	327.9	332.2	336.4
-6.0	308.1	312.8	317.4	321.9	326.2	330.5	334.8
-4.0	306.5	311.2	315.8	320.3	324.7	329.0	333.2
-2.0	304.9	309.6	314.2	318.7	323.1	327.4	331.6
0.0	303.4	308.1	312.7	317.1	321.5	325.8	330.0
2.0	301.9	306.5	311.1	315.6	320.0	324.3	328.5
4.0	300.3	305.0	309.6	314.1	318.4	322.7	326.9
6.0	298.8	303.5	308.1	312.5	316.9	321.2	325.4
8.0	297.4	302.0	306.6	311.0	315.4	319.7	323.9
10.0	295.9	300.5	305.1	309.6	313.9	318.2	322.4
12.0	294.4	299.1	303.6	308.1	312.4	316.7	320.9
14.0	293.0	297.6	302.2	306.6	311.0	315.3	319.4
16.0	291.6	296.2	300.7	305.2	309.5	313.8	318.0
18.0	290.2	294.8	299.3	303.8	308.1	312.4	316.5
20.0	288.8	293.4	297.9	302.3	306.7	310.9	315.1
22.0	287.4	292.0	296.5	300.9	305.3	309.5	313.7
24.0	286.0	290.6	295.1	299.6	303.9	308.1	312.3
26.0	284.7	289.3	293.8	298.2	302.5	306.7	310.9
28.0	283.3	287.9	292.4	296.8	301.1	305.4	309.5
30.0	282.0	286.6	291.1	295.5	299.8	304.0	308.2
32.0	280.7	285.3	289.7	294.1	298.4	302.7	306.8
34.0	279.4	284.0	288.4	292.8	297.1	301.3	305.5
36.0	278.1	282.7	287.1	291.5	295.8	300.0	304.1
38.0	276.8	281.4	285.8	290.2	294.5	298.7	302.8
40.0	275.6	280.1	284.5	288.9	293.2	297.4	301.5
42.0	274.3	278.8	283.3	287.6	291.9	296.1	300.2
44.0	273.1	277.6	282.0	286.4	290.6	294.8	298.9
46.0	271.9	276.4	280.8	285.1	289.4	293.6	297.7

Table 11-3. Nitrogen Contents Table (SCF/cu ft) - Continued

°F	4300 psig	4400 psig	4500 psig	4600 psig	4700 psig	4800 psig	4900 psig
48.0	270.7	275.1	279.6	283.9	288.1	292.3	296.4
50.0	269.5	273.9	278.3	282.6	286.9	291.1	295.1
52.0	268.3	272.7	277.1	281.4	285.7	289.8	293.9
54.0	267.1	271.5	275.9	280.2	284.5	288.6	292.7
56.0	265.9	270.4	274.7	279.0	283.2	287.4	291.5
58.0	264.8	269.2	273.6	277.8	282.1	286.2	290.3
60.0	263.6	268.0	272.4	276.7	280.9	285.0	289.1
62.0	262.5	266.9	271.2	275.5	279.7	283.8	287.9
64.0	261.4	265.8	270.1	274.4	278.5	282.7	286.7
66.0	260.2	264.6	269.0	273.2	277.4	281.5	285.5
68.0	259.1	263.5	267.8	272.1	276.3	280.4	284.4
70.0	258.0	262.4	266.7	271.0	275.1	279.2	283.2
72.0	257.0	261.3	265.6	269.8	274.0	278.1	282.1
74.0	255.9	260.2	264.5	268.7	272.9	277.0	281.0
76.0	254.8	259.2	263.4	267.7	271.8	275.9	279.9
78.0	253.8	258.1	262.4	266.6	270.7	274.8	278.8
80.0	252.7	257.0	261.3	265.5	269.6	273.7	277.7
82.0	251.7	256.0	260.3	264.4	268.5	272.6	276.6
84.0	250.7	255.0	259.2	263.4	267.5	271.5	275.5
86.0	249.6	253.9	258.2	262.3	266.4	270.5	274.4
88.0	248.6	252.9	257.1	261.3	265.4	269.4	273.4
90.0	247.6	251.9	256.1	260.3	264.3	268.4	272.3
92.0	246.6	250.9	255.1	259.3	263.3	267.3	271.3
94.0	245.7	249.9	254.1	258.2	262.3	266.3	270.2
96.0	244.7	248.9	253.1	257.2	261.3	265.3	269.2
98.0	243.7	248.0	252.1	256.2	260.3	264.3	268.2
100.0	242.8	247.0	251.2	255.3	259.3	263.3	267.2
102.0	241.8	246.0	250.2	254.3	258.3	262.3	266.2
104.0	240.9	245.1	249.2	253.3	257.3	261.3	265.2
106.0	240.0	244.2	248.3	252.4	256.4	260.3	264.2
108.0	239.0	243.2	247.3	251.4	255.4	259.3	263.2
110.0	238.1	242.3	246.4	250.5	254.5	258.4	262.3
112.0	237.2	241.4	245.5	249.5	253.5	257.4	261.3
114.0	236.3	240.5	244.6	248.6	252.6	256.5	260.3
116.0	235.4	239.6	243.7	247.7	251.6	255.6	259.4
118.0	234.5	238.7	242.7	246.8	250.7	254.6	258.5
120.0	233.7	237.8	241.9	245.9	249.8	253.7	257.5
122.0	232.8	236.9	241.0	245.0	248.9	252.8	256.6
124.0	231.9	236.0	240.1	244.1	248.0	251.9	255.7
126.0	231.1	235.2	239.2	243.2	247.1	251.0	254.8
128.0	230.2	234.3	238.3	242.3	246.2	250.1	253.9
130.0	229.4	233.5	237.5	241.4	245.3	249.2	253.0

Table 11-3. Nitrogen Contents Table (SCF/cu ft) - Continued

°F	5000 psig	5100 psig	5200 psig	5300 psig	5400 psig	5500 psig	5600 psig
-40.0	368.3	372.3	376.2	380.0	383.8	387.4	391.0
-38.0	366.5	370.5	374.4	378.2	381.9	385.6	389.1
-36.0	364.6	368.6	372.5	376.4	380.1	383.8	387.3
-34.0	362.8	366.8	370.7	374.6	378.3	382.0	385.5
-32.0	361.0	365.0	368.9	372.8	376.5	380.2	383.8
-30.0	359.2	363.2	367.1	371.0	374.7	378.4	382.0
-28.0	357.4	361.4	365.4	369.2	373.0	376.6	380.2
-26.0	355.7	359.7	363.6	367.4	371.2	374.9	378.5
-24.0	353.9	357.9	361.9	365.7	369.5	373.2	376.8
-22.0	352.2	356.2	360.1	364.0	367.8	371.4	375.1
-20.0	350.5	354.5	358.4	362.3	366.0	369.7	373.4
-18.0	348.8	352.8	356.7	360.6	364.4	368.0	371.7
-16.0	347.1	351.1	355.0	358.9	362.7	366.4	370.0
-14.0	345.4	349.4	353.4	357.2	361.0	364.7	368.3
-12.0	343.7	347.8	351.7	355.6	359.4	363.1	366.7
-10.0	342.1	346.1	350.1	353.9	357.7	361.4	365.1
-8.0	340.5	344.5	348.5	352.3	356.1	359.8	363.4
-6.0	338.9	342.9	346.8	350.7	354.5	358.2	361.8
-4.0	337.3	341.3	345.2	349.1	352.9	356.6	360.2
-2.0	335.7	339.7	343.7	347.5	351.3	355.0	358.7
0.0	334.1	338.1	342.1	346.0	349.7	353.5	357.1
2.0	332.6	336.6	340.5	344.4	348.2	351.9	355.5
4.0	331.0	335.1	339.0	342.9	346.7	350.4	354.0
6.0	329.5	333.5	337.5	341.3	345.1	348.8	352.5
8.0	328.0	332.0	336.0	339.8	343.6	347.3	351.0
10.0	326.5	330.5	334.5	338.3	342.1	345.8	349.5
12.0	325.0	329.0	333.0	336.8	340.6	344.3	348.0
14.0	323.5	327.5	331.5	335.3	339.1	342.8	346.5
16.0	322.1	326.1	330.0	333.9	337.7	341.4	345.0
18.0	320.6	324.6	328.6	332.4	336.2	339.9	343.6
20.0	319.2	323.2	327.1	331.0	334.8	338.5	342.1
22.0	317.8	321.8	325.7	329.6	333.3	337.1	340.7
24.0	316.4	320.4	324.3	328.1	331.9	335.6	339.3
26.0	315.0	319.0	322.9	326.7	330.5	334.2	337.9
28.0	313.6	317.6	321.5	325.3	329.1	332.8	336.5
30.0	312.2	316.2	320.1	324.0	327.7	331.4	335.1
32.0	310.9	314.8	318.8	322.6	326.4	330.1	333.7
34.0	309.5	313.5	317.4	321.2	325.0	328.7	332.3
36.0	308.2	312.2	316.1	319.9	323.7	327.4	331.0
38.0	306.9	310.8	314.7	318.6	322.3	326.0	329.7
40.0	305.5	309.5	313.4	317.2	321.0	324.7	328.3
42.0	304.2	308.2	312.1	315.9	319.7	323.4	327.0
44.0	303.0	306.9	310.8	314.6	318.4	322.1	325.7
46.0	301.7	305.6	309.5	313.3	317.1	320.8	324.4

Table 11-3. Nitrogen Contents Table (SCF/cu ft) - Continued

°F	5000 psig	5100 psig	5200 psig	5300 psig	5400 psig	5500 psig	5600 psig
48.0	300.4	304.4	308.2	312.1	315.8	319.5	323.1
50.0	299.2	303.1	307.0	310.8	314.5	318.2	321.8
52.0	297.9	301.9	305.7	309.5	313.3	316.9	320.6
54.0	296.7	300.6	304.5	308.3	312.0	315.7	319.3
56.0	295.5	299.4	303.3	307.1	310.8	314.4	318.1
58.0	294.3	298.2	302.0	305.8	309.6	313.2	316.8
60.0	293.0	297.0	300.8	304.6	308.3	312.0	315.6
62.0	291.9	295.8	299.6	303.4	307.1	310.8	314.4
64.0	290.7	294.6	298.4	302.2	305.9	309.6	313.2
66.0	289.5	293.4	297.2	301.0	304.7	308.4	312.0
68.0	288.3	292.2	296.1	299.8	303.5	307.2	310.8
70.0	287.2	291.1	294.9	298.7	302.4	306.0	309.6
72.0	286.1	289.9	293.8	297.5	301.2	304.8	308.4
74.0	284.9	288.8	292.6	296.4	300.1	303.7	307.3
76.0	283.8	287.7	291.5	295.2	298.9	302.5	306.1
78.0	282.7	286.6	290.4	294.1	297.8	301.4	305.0
80.0	281.6	285.4	289.2	293.0	296.7	300.3	303.8
82.0	280.5	284.3	288.1	291.9	295.5	299.1	302.7
84.0	279.4	283.2	287.0	290.8	294.4	298.0	301.6
86.0	278.3	282.2	285.9	289.7	293.3	296.9	300.5
88.0	277.3	281.1	284.9	288.6	292.2	295.8	299.4
90.0	276.2	280.0	283.8	287.5	291.2	294.7	298.3
92.0	275.2	279.0	282.7	286.4	290.1	293.7	297.2
94.0	274.1	277.9	281.7	285.4	289.0	292.6	296.1
96.0	273.1	276.9	280.6	284.3	288.0	291.5	295.1
98.0	272.1	275.9	279.6	283.3	286.9	290.5	294.0
100.0	271.0	274.8	278.6	282.2	285.9	289.4	292.9
102.0	270.0	273.8	277.5	281.2	284.8	288.4	291.9
104.0	269.0	272.8	276.5	280.2	283.8	287.4	290.9
106.0	268.0	271.8	275.5	279.2	282.8	286.3	289.8
108.0	267.1	270.8	274.5	278.2	281.8	285.3	288.8
110.0	266.1	269.8	273.5	277.2	280.8	284.3	287.8
112.0	265.1	268.9	272.6	276.2	279.8	283.3	286.8
114.0	264.1	267.9	271.6	275.2	278.8	282.3	285.8
116.0	263.2	266.9	270.6	274.2	277.8	281.3	284.8
118.0	262.2	266.0	269.7	273.3	276.8	280.4	283.8
120.0	261.3	265.0	268.7	272.3	275.9	279.4	282.9
122.0	260.4	264.1	267.8	271.4	274.9	278.4	281.9
124.0	259.5	263.2	266.8	270.4	274.0	277.5	280.9
126.0	258.5	262.2	265.9	269.5	273.0	276.5	280.0
128.0	257.6	261.3	265.0	268.6	272.1	275.6	279.0
130.0	256.7	260.4	264.1	267.6	271.2	274.7	278.1

Table 11-3. Nitrogen Contents Table (SCF/cu ft) - Continued

°F	5700 psig	5800 psig	5900 psig	6000 psig
-40.0	394.5	397.9	401.2	404.5
-38.0	392.6	396.1	399.4	402.7
-36.0	390.8	394.3	397.6	400.9
-34.0	389.0	392.5	395.8	399.1
-32.0	387.3	390.7	394.1	397.4
-30.0	385.5	389.0	392.3	395.6
-28.0	383.8	387.2	390.6	393.9
-26.0	382.0	385.5	388.9	392.2
-24.0	380.3	383.8	387.2	390.5
-22.0	378.6	382.1	385.5	388.8
-20.0	376.9	380.4	383.8	387.1
-18.0	375.2	378.7	382.1	385.4
-16.0	373.5	377.0	380.4	383.8
-14.0	371.9	375.4	378.8	382.1
-12.0	370.3	373.7	377.2	380.5
-10.0	368.6	372.1	375.5	378.9
-8.0	367.0	370.5	373.9	377.3
-6.0	365.4	368.9	372.3	375.7
-4.0	363.8	367.3	370.7	374.1
-2.0	362.2	365.7	369.2	372.5
0.0	360.7	364.2	367.6	371.0
2.0	359.1	362.6	366.1	369.4
4.0	357.6	361.1	364.5	367.9
6.0	356.1	359.6	363.0	366.4
8.0	354.5	358.0	361.5	364.9
10.0	353.0	356.5	360.0	363.4
12.0	351.5	355.1	358.5	361.9
14.0	350.1	353.6	357.0	360.4
16.0	348.6	352.1	355.6	358.9
18.0	347.1	350.7	354.1	357.5
20.0	345.7	349.2	352.7	356.1
22.0	344.3	347.8	351.2	354.6
24.0	342.9	346.4	349.8	353.2
26.0	341.4	345.0	348.4	351.8
28.0	340.0	343.6	347.0	350.4
30.0	338.7	342.2	345.6	349.0
32.0	337.3	340.8	344.2	347.6
34.0	335.9	339.4	342.9	346.3
36.0	334.6	338.1	341.5	344.9
38.0	333.2	336.7	340.2	343.6
40.0	331.9	335.4	338.8	342.2
42.0	330.6	334.1	337.5	340.9
44.0	329.3	332.8	336.2	339.6
46.0	328.0	331.5	334.9	338.3

Table 11-3. Nitrogen Contents Table (SCF/cu ft) - Continued

°F	5700 psig	5800 psig	5900 psig	6000 psig
48.0	326.7	330.2	333.6	337.0
50.0	325.4	328.9	332.3	335.7
52.0	324.1	327.6	331.0	334.4
54.0	322.9	326.3	329.8	333.1
56.0	321.6	325.1	328.5	331.9
58.0	320.4	323.8	327.3	330.6
60.0	319.1	322.6	326.0	329.4
62.0	317.9	321.4	324.8	328.2
64.0	316.7	320.2	323.6	327.0
66.0	315.5	319.0	322.4	325.7
68.0	314.3	317.8	321.2	324.5
70.0	313.1	316.6	320.0	323.4
72.0	311.9	315.4	318.8	322.2
74.0	310.8	314.2	317.6	321.0
76.0	309.6	313.1	316.5	319.8
78.0	308.5	311.9	315.3	318.7
80.0	307.3	310.8	314.2	317.5
82.0	306.2	309.7	313.0	316.4
84.0	305.1	308.5	311.9	315.3
86.0	304.0	307.4	310.8	314.1
88.0	302.9	306.3	309.7	313.0
90.0	301.8	305.2	308.6	311.9
92.0	300.7	304.1	307.5	310.8
94.0	299.6	303.0	306.4	309.7
96.0	298.5	301.9	305.3	308.6
98.0	297.5	300.9	304.2	307.6
100.0	296.4	299.8	303.2	306.5
102.0	295.4	298.8	302.1	305.4
104.0	294.3	297.7	301.1	304.4
106.0	293.3	296.7	300.0	303.3
108.0	292.3	295.7	299.0	302.3
110.0	291.3	294.6	298.0	301.3
112.0	290.2	293.6	297.0	300.3
114.0	289.2	292.6	296.0	299.2
116.0	288.2	291.6	294.9	298.2
118.0	287.3	290.6	294.0	297.2
120.0	286.3	289.6	293.0	296.2
122.0	285.3	288.7	292.0	295.2
124.0	284.3	287.7	291.0	294.3
126.0	283.4	286.7	290.0	293.3
128.0	282.4	285.8	289.1	292.3
130.0	281.5	284.8	288.1	291.4

Table 11-4. Helium Contents Table (SCF/cu ft)

°F	100 psig	200 psig	300 psig	400 psig	500 psig	600 psig	700 psig
-40.0	9.806	18.28	26.68	35.00	43.26	51.45	59.58
-38.0	9.760	18.19	26.55	34.84	43.06	51.22	59.30
-36.0	9.714	18.11	26.43	34.68	42.86	50.98	59.03
-34.0	9.669	18.02	26.31	34.52	42.67	50.75	58.76
-32.0	9.624	17.94	26.18	34.36	42.47	50.52	58.50
-30.0	9.579	17.86	26.06	34.20	42.28	50.29	58.23
-28.0	9.535	17.77	25.95	34.05	42.09	50.06	57.97
-26.0	9.491	17.69	25.83	33.90	41.90	49.84	57.71
-24.0	9.448	17.61	25.71	33.74	41.71	49.61	57.45
-22.0	9.405	17.53	25.59	33.59	41.52	49.39	57.20
-20.0	9.362	17.45	25.48	33.44	41.34	49.17	56.95
-18.0	9.320	17.38	25.37	33.29	41.16	48.96	56.70
-16.0	9.278	17.30	25.25	33.14	40.97	48.74	56.45
-14.0	9.237	17.22	25.14	33.00	40.79	48.53	56.20
-12.0	9.196	17.14	25.03	32.85	40.62	48.32	55.96
-10.0	9.155	17.07	24.92	32.71	40.44	48.11	55.72
-8.0	9.115	16.99	24.81	32.57	40.26	47.90	55.48
-6.0	9.075	16.92	24.70	32.43	40.09	47.70	55.24
-4.0	9.035	16.85	24.60	32.29	39.92	47.49	55.01
-2.0	8.996	16.77	24.49	32.15	39.75	47.29	54.77
0.0	8.957	16.70	24.39	32.01	39.58	47.09	54.54
2.0	8.918	16.63	24.28	31.87	39.41	46.89	54.31
4.0	8.880	16.56	24.18	31.74	39.24	46.69	54.09
6.0	8.842	16.49	24.08	31.61	39.08	46.50	53.86
8.0	8.805	16.42	23.97	31.47	38.92	46.30	53.64
10.0	8.767	16.35	23.87	31.34	38.75	46.11	53.42
12.0	8.730	16.28	23.77	31.21	38.59	45.92	53.20
14.0	8.694	16.21	23.67	31.08	38.43	45.73	52.98
16.0	8.657	16.14	23.58	30.95	38.27	45.54	52.76
18.0	8.621	16.08	23.48	30.83	38.12	45.36	52.55
20.0	8.585	16.01	23.38	30.70	37.96	45.17	52.33
22.0	8.550	15.95	23.29	30.57	37.81	44.99	52.12
24.0	8.515	15.88	23.19	30.45	37.65	44.81	51.91
26.0	8.480	15.81	23.10	30.33	37.50	44.63	51.70
28.0	8.445	15.75	23.00	30.20	37.35	44.45	51.50
30.0	8.411	15.69	22.91	30.08	37.20	44.27	51.29
32.0	8.377	15.62	22.82	29.96	37.05	44.10	51.09
34.0	8.343	15.56	22.73	29.84	36.91	43.92	50.89
36.0	8.310	15.50	22.64	29.72	36.76	43.75	50.69
38.0	8.276	15.44	22.55	29.61	36.62	43.58	50.49
40.0	8.243	15.38	22.46	29.49	36.47	43.41	50.30
42.0	8.211	15.31	22.37	29.37	36.33	43.24	50.10
44.0	8.178	15.25	22.28	29.26	36.19	43.07	49.91

Table 11-4. Helium Contents Table (SCF/cu ft) - Continued

°F	100 psig	200 psig	300 psig	400 psig	500 psig	600 psig	700 psig
46.0	8.146	15.19	22.19	29.15	36.05	42.90	49.71
48.0	8.114	15.14	22.11	29.03	35.91	42.74	49.52
50.0	8.082	15.08	22.02	28.92	35.77	42.58	49.33
52.0	8.051	15.02	21.94	28.81	35.63	42.41	49.15
54.0	8.020	14.96	21.85	28.70	35.50	42.25	48.96
56.0	7.989	14.90	21.77	28.59	35.36	42.09	48.78
58.0	7.958	14.85	21.69	28.48	35.23	41.93	48.59
60.0	7.927	14.79	21.60	28.37	35.10	41.78	48.41
62.0	7.897	14.73	21.52	28.27	34.96	41.62	48.23
64.0	7.867	14.68	21.44	28.16	34.83	41.46	48.05
66.0	7.837	14.62	21.36	28.05	34.70	41.31	47.87
68.0	7.808	14.57	21.28	27.95	34.57	41.16	47.70
70.0	7.778	14.51	21.20	27.84	34.45	41.00	47.52
72.0	7.749	14.46	21.12	27.74	34.32	40.85	47.35
74.0	7.720	14.40	21.04	27.64	34.19	40.70	47.17
76.0	7.692	14.35	20.97	27.54	34.07	40.55	47.00
78.0	7.663	14.30	20.89	27.44	33.94	40.41	46.83
80.0	7.635	14.24	20.81	27.34	33.82	40.26	46.66
82.0	7.607	14.19	20.74	27.24	33.70	40.12	46.49
84.0	7.579	14.14	20.66	27.14	33.58	39.97	46.33
86.0	7.551	14.09	20.59	27.04	33.45	39.83	46.16
88.0	7.524	14.04	20.51	26.94	33.33	39.69	46.00
90.0	7.497	13.99	20.44	26.85	33.22	39.54	45.83
92.0	7.469	13.94	20.36	26.75	33.10	39.40	45.67
94.0	7.443	13.89	20.29	26.66	32.98	39.26	45.51
96.0	7.416	13.84	20.22	26.56	32.86	39.13	45.35
98.0	7.389	13.79	20.15	26.47	32.75	38.99	45.19
100.0	7.363	13.74	20.08	26.37	32.63	38.85	45.04
102.0	7.337	13.69	20.01	26.28	32.52	38.72	44.88
104.0	7.311	13.64	19.94	26.19	32.40	38.58	44.72
106.0	7.285	13.59	19.87	26.10	32.29	38.45	44.57
108.0	7.260	13.55	19.80	26.01	32.18	38.32	44.42
110.0	7.234	13.50	19.73	25.92	32.07	38.18	44.26
112.0	7.209	13.45	19.66	25.83	31.96	38.05	44.11
114.0	7.184	13.41	19.59	25.74	31.85	37.92	43.96
116.0	7.159	13.36	19.52	25.65	31.74	37.79	43.81
118.0	7.135	13.31	19.46	25.56	31.63	37.67	43.67
120.0	7.110	13.27	19.39	25.48	31.53	37.54	43.52
122.0	7.086	13.22	19.32	25.39	31.42	37.41	43.37
124.0	7.062	13.18	19.26	25.30	31.31	37.29	43.23
126.0	7.038	13.13	19.19	25.22	31.21	37.16	43.08
128.0	7.014	13.09	19.13	25.13	31.10	37.04	42.94
130.0	6.990	13.05	19.07	25.05	31.00	36.92	42.80

Table 11-4. Helium Contents Table (SCF/cu ft) - Continued

°F	800 psig	900 psig	1000 psig	1100 psig	1200 psig	1300 psig	1400 psig
-40.0	67.63	75.62	83.55	91.41	99.21	106.9	114.6
-38.0	67.32	75.28	83.17	91.00	98.76	106.5	114.1
-36.0	67.02	74.94	82.79	90.59	98.32	106.0	113.6
-34.0	66.71	74.60	82.42	90.18	97.88	105.5	113.1
-32.0	66.41	74.26	82.05	89.78	97.45	105.1	112.6
-30.0	66.11	73.93	81.69	89.38	97.02	104.6	112.1
-28.0	65.82	73.60	81.33	88.99	96.59	104.1	111.6
-26.0	65.52	73.28	80.97	88.60	96.17	103.7	111.1
-24.0	65.23	72.95	80.61	88.21	95.75	103.2	110.7
-22.0	64.95	72.63	80.26	87.83	95.34	102.8	110.2
-20.0	64.66	72.31	79.91	87.45	94.92	102.3	109.7
-18.0	64.38	72.00	79.56	87.07	94.52	101.9	109.2
-16.0	64.10	71.69	79.22	86.69	94.11	101.5	108.8
-14.0	63.82	71.38	78.88	86.32	93.71	101.0	108.3
-12.0	63.55	71.07	78.54	85.95	93.31	100.6	107.9
-10.0	63.27	70.77	78.21	85.59	92.92	100.2	107.4
-8.0	63.00	70.47	77.87	85.23	92.53	99.77	107.0
-6.0	62.73	70.17	77.55	84.87	92.14	99.36	106.5
-4.0	62.47	69.87	77.22	84.51	91.76	98.94	106.1
-2.0	62.20	69.58	76.90	84.16	91.37	98.53	105.6
0.0	61.94	69.29	76.58	83.81	91.00	98.13	105.2
2.0	61.68	69.00	76.26	83.47	90.62	97.73	104.8
4.0	61.42	68.71	75.94	83.12	90.25	97.33	104.4
6.0	61.17	68.43	75.63	82.78	89.88	96.93	103.9
8.0	60.92	68.14	75.32	82.44	89.51	96.54	103.5
10.0	60.67	67.86	75.01	82.11	89.15	96.15	103.1
12.0	60.42	67.59	74.71	81.77	88.79	95.76	102.7
14.0	60.17	67.31	74.40	81.44	88.43	95.38	102.3
16.0	59.93	67.04	74.10	81.12	88.08	95.00	101.9
18.0	59.68	66.77	73.80	80.79	87.73	94.62	101.5
20.0	59.44	66.50	73.51	80.47	87.38	94.24	101.1
22.0	59.20	66.23	73.22	80.15	87.03	93.87	100.7
24.0	58.97	65.97	72.92	79.83	86.69	93.50	100.3
26.0	58.73	65.71	72.64	79.52	86.35	93.14	99.88
28.0	58.50	65.45	72.35	79.20	86.01	92.77	99.49
30.0	58.27	65.19	72.07	78.89	85.68	92.41	99.11
32.0	58.04	64.93	71.78	78.59	85.35	92.06	98.72
34.0	57.81	64.68	71.50	78.28	85.02	91.70	98.35
36.0	57.58	64.43	71.23	77.98	84.69	91.35	97.97
38.0	57.36	64.18	70.95	77.68	84.36	91.00	97.60
40.0	57.14	63.93	70.68	77.38	84.04	90.66	97.23
42.0	56.92	63.68	70.41	77.09	83.72	90.31	96.86
44.0	56.70	63.44	70.14	76.79	83.40	89.97	96.49
46.0	56.48	63.20	69.87	76.50	83.09	89.63	96.13

Table 11-4. Helium Contents Table (SCF/cu ft) - Continued

°F	800 psig	900 psig	1000 psig	1100 psig	1200 psig	1300 psig	1400 psig
48.0	56.26	62.96	69.61	76.21	82.78	89.30	95.77
50.0	56.05	62.72	69.34	75.93	82.46	88.96	95.42
52.0	55.84	62.48	69.08	75.64	82.16	88.63	95.06
54.0	55.63	62.25	68.82	75.36	81.85	88.30	94.71
56.0	55.42	62.01	68.57	75.08	81.55	87.98	94.36
58.0	55.21	61.78	68.31	74.80	81.25	87.65	94.02
60.0	55.00	61.55	68.06	74.52	80.95	87.33	93.67
62.0	54.80	61.32	67.81	74.25	80.65	87.01	93.33
64.0	54.59	61.10	67.56	73.98	80.36	86.69	92.99
66.0	54.39	60.87	67.31	73.71	80.06	86.38	92.66
68.0	54.19	60.65	67.06	73.44	79.77	86.07	92.32
70.0	53.99	60.43	66.82	73.17	79.48	85.76	91.99
72.0	53.80	60.21	66.58	72.91	79.20	85.45	91.66
74.0	53.60	59.99	66.34	72.65	78.91	85.14	91.34
76.0	53.41	59.77	66.10	72.38	78.63	84.84	91.01
78.0	53.21	59.56	65.86	72.13	78.35	84.54	90.69
80.0	53.02	59.34	65.63	71.87	78.07	84.24	90.37
82.0	52.83	59.13	65.39	71.61	77.80	83.94	90.05
84.0	52.64	58.92	65.16	71.36	77.52	83.65	89.74
86.0	52.46	58.71	64.93	71.11	77.25	83.36	89.42
88.0	52.27	58.50	64.70	70.86	76.98	83.07	89.11
90.0	52.09	58.30	64.47	70.61	76.71	82.78	88.81
92.0	51.90	58.09	64.25	70.36	76.45	82.49	88.50
94.0	51.72	57.89	64.02	70.12	76.18	82.21	88.19
96.0	51.54	57.69	63.80	69.88	75.92	81.92	87.89
98.0	51.36	57.49	63.58	69.64	75.66	81.64	87.59
100.0	51.18	57.29	63.36	69.40	75.40	81.36	87.29
102.0	51.00	57.09	63.14	69.16	75.14	81.09	87.00
104.0	50.83	56.89	62.93	68.92	74.88	80.81	86.70
106.0	50.65	56.70	62.71	68.69	74.63	80.54	86.41
108.0	50.48	56.51	62.50	68.46	74.38	80.27	86.12
110.0	50.31	56.31	62.29	68.22	74.13	80.00	85.83
112.0	50.14	56.12	62.08	67.99	73.88	79.73	85.55
114.0	49.97	55.93	61.87	67.77	73.63	79.46	85.26
116.0	49.80	55.74	61.66	67.54	73.38	79.20	84.98
118.0	49.63	55.56	61.45	67.31	73.14	78.94	84.70
120.0	49.46	55.37	61.25	67.09	72.90	78.67	84.42
122.0	49.30	55.19	61.04	66.87	72.66	78.42	84.14
124.0	49.13	55.00	60.84	66.65	72.42	78.16	83.87
126.0	48.97	54.82	60.64	66.43	72.18	77.90	83.59
128.0	48.81	54.64	60.44	66.21	71.94	77.65	83.32
130.0	48.65	54.46	60.24	65.99	71.71	77.40	83.05

Table 11-4. Helium Contents Table (SCF/cu ft) - Continued

°F	1500 psig	1600 psig	1700 psig	1800 psig	1900 psig	2000 psig	2100 psig
-40.0	122.2	129.8	137.3	144.7	152.1	159.5	166.7
-38.0	121.7	129.2	136.7	144.1	151.5	158.8	166.0
-36.0	121.2	128.7	136.1	143.5	150.8	158.1	165.3
-34.0	120.6	128.1	135.5	142.9	150.2	157.4	164.6
-32.0	120.1	127.5	134.9	142.2	149.5	156.7	163.9
-30.0	119.6	127.0	134.3	141.6	148.9	156.1	163.2
-28.0	119.1	126.4	133.8	141.0	148.2	155.4	162.5
-26.0	118.5	125.9	133.2	140.4	147.6	154.7	161.8
-24.0	118.0	125.4	132.6	139.8	147.0	154.1	161.1
-22.0	117.5	124.8	132.0	139.2	146.4	153.4	160.5
-20.0	117.0	124.3	131.5	138.6	145.7	152.8	159.8
-18.0	116.5	123.8	130.9	138.1	145.1	152.2	159.1
-16.0	116.0	123.2	130.4	137.5	144.5	151.5	158.5
-14.0	115.5	122.7	129.8	136.9	143.9	150.9	157.8
-12.0	115.1	122.2	129.3	136.3	143.3	150.3	157.2
-10.0	114.6	121.7	128.8	135.8	142.7	149.7	156.5
-8.0	114.1	121.2	128.2	135.2	142.2	149.1	155.9
-6.0	113.6	120.7	127.7	134.7	141.6	148.4	155.3
-4.0	113.2	120.2	127.2	134.1	141.0	147.8	154.6
-2.0	112.7	119.7	126.7	133.6	140.4	147.3	154.0
0.0	112.2	119.2	126.2	133.0	139.9	146.7	153.4
2.0	111.8	118.7	125.6	132.5	139.3	146.1	152.8
4.0	111.3	118.3	125.1	132.0	138.8	145.5	152.2
6.0	110.9	117.8	124.6	131.4	138.2	144.9	151.6
8.0	110.4	117.3	124.1	130.9	137.7	144.3	151.0
10.0	110.0	116.8	123.6	130.4	137.1	143.8	150.4
12.0	109.6	116.4	123.2	129.9	136.6	143.2	149.8
14.0	109.1	115.9	122.7	129.4	136.0	142.7	149.2
16.0	108.7	115.5	122.2	128.9	135.5	142.1	148.7
18.0	108.3	115.0	121.7	128.4	135.0	141.6	148.1
20.0	107.8	114.6	121.2	127.9	134.5	141.0	147.5
22.0	107.4	114.1	120.8	127.4	133.9	140.5	146.9
24.0	107.0	113.7	120.3	126.9	133.4	139.9	146.4
26.0	106.6	113.2	119.8	126.4	132.9	139.4	145.8
28.0	106.2	112.8	119.4	125.9	132.4	138.9	145.3
30.0	105.8	112.4	118.9	125.4	131.9	138.3	144.7
32.0	105.3	111.9	118.5	125.0	131.4	137.8	144.2
34.0	104.9	111.5	118.0	124.5	130.9	137.3	143.6
36.0	104.5	111.1	117.6	124.0	130.4	136.8	143.1
38.0	104.1	110.7	117.1	123.5	129.9	136.3	142.6
40.0	103.8	110.2	116.7	123.1	129.4	135.8	142.1
42.0	103.4	109.8	116.2	122.6	129.0	135.3	141.5
44.0	103.0	109.4	115.8	122.2	128.5	134.8	141.0
46.0	102.6	109.0	115.4	121.7	128.0	134.3	140.5

Table 11-4. Helium Contents Table (SCF/cu ft) - Continued

°F	1500 psig	1600 psig	1700 psig	1800 psig	1900 psig	2000 psig	2100 psig
48.0	102.2	108.6	115.0	121.3	127.5	133.8	140.0
50.0	101.8	108.2	114.5	120.8	127.1	133.3	139.5
52.0	101.5	107.8	114.1	120.4	126.6	132.8	139.0
54.0	101.1	107.4	113.7	119.9	126.2	132.3	138.5
56.0	100.7	107.0	113.3	119.5	125.7	131.9	138.0
58.0	100.3	106.6	112.9	119.1	125.3	131.4	137.5
60.0	99.98	106.2	112.5	118.7	124.8	130.9	137.0
62.0	99.61	105.9	112.1	118.2	124.4	130.4	136.5
64.0	99.25	105.5	111.7	117.8	123.9	130.0	136.0
66.0	98.90	105.1	111.3	117.4	123.5	129.5	135.5
68.0	98.54	104.7	110.9	117.0	123.0	129.1	135.1
70.0	98.19	104.3	110.5	116.6	122.6	128.6	134.6
72.0	97.84	104.0	110.1	116.1	122.2	128.2	134.1
74.0	97.49	103.6	109.7	115.7	121.7	127.7	133.6
76.0	97.15	103.2	109.3	115.3	121.3	127.3	133.2
78.0	96.80	102.9	108.9	114.9	120.9	126.8	132.7
80.0	96.46	102.5	108.5	114.5	120.5	126.4	132.3
82.0	96.13	102.2	108.2	114.1	120.1	126.0	131.8
84.0	95.79	101.8	107.8	113.7	119.6	125.5	131.4
86.0	95.46	101.5	107.4	113.3	119.2	125.1	130.9
88.0	95.13	101.1	107.0	113.0	118.8	124.7	130.5
90.0	94.80	100.8	106.7	112.6	118.4	124.2	130.0
92.0	94.47	100.4	106.3	112.2	118.0	123.8	129.6
94.0	94.15	100.1	106.0	111.8	117.6	123.4	129.2
96.0	93.83	99.73	105.6	111.4	117.2	123.0	128.7
98.0	93.51	99.39	105.2	111.0	116.8	122.6	128.3
100.0	93.19	99.05	104.9	110.7	116.4	122.2	127.9
102.0	92.87	98.72	104.5	110.3	116.0	121.8	127.4
104.0	92.56	98.39	104.2	109.9	115.7	121.4	127.0
106.0	92.25	98.06	103.8	109.6	115.3	121.0	126.6
108.0	91.94	97.73	103.5	109.2	114.9	120.6	126.2
110.0	91.63	97.40	103.1	108.8	114.5	120.2	125.8
112.0	91.33	97.08	102.8	108.5	114.1	119.8	125.4
114.0	91.03	96.76	102.5	108.1	113.8	119.4	125.0
116.0	90.73	96.44	102.1	107.8	113.4	119.0	124.5
118.0	90.43	96.12	101.8	107.4	113.0	118.6	124.1
120.0	90.13	95.81	101.5	107.1	112.7	118.2	123.7
122.0	89.84	95.50	101.1	106.7	112.3	117.8	123.3
124.0	89.54	95.19	100.8	106.4	111.9	117.5	123.0
126.0	89.25	94.88	100.5	106.0	111.6	117.1	122.6
128.0	88.96	94.57	100.2	105.7	111.2	116.7	122.2
130.0	88.67	94.27	99.83	105.4	110.9	116.3	121.8

Table 11-4. Helium Contents Table (SCF/cu ft) - Continued

°F	2200 psig	2300 psig	2400 psig	2500 psig	2600 psig	2700 psig	2800 psig
-40.0	173.9	181.1	188.2	195.3	202.3	209.3	216.2
-38.0	173.2	180.3	187.4	194.5	201.4	208.4	215.3
-36.0	172.5	179.6	186.6	193.6	200.6	207.5	214.4
-34.0	171.7	178.8	185.8	192.8	199.7	206.6	213.5
-32.0	171.0	178.0	185.1	192.0	198.9	205.8	212.6
-30.0	170.3	177.3	184.3	191.2	198.1	204.9	211.7
-28.0	169.5	176.6	183.5	190.4	197.3	204.1	210.8
-26.0	168.8	175.8	182.7	189.6	196.4	203.2	210.0
-24.0	168.1	175.1	182.0	188.8	195.6	202.4	209.1
-22.0	167.4	174.4	181.2	188.1	194.8	201.6	208.3
-20.0	166.7	173.6	180.5	187.3	194.0	200.7	207.4
-18.0	166.0	172.9	179.7	186.5	193.3	199.9	206.6
-16.0	165.4	172.2	179.0	185.8	192.5	199.1	205.7
-14.0	164.7	171.5	178.3	185.0	191.7	198.3	204.9
-12.0	164.0	170.8	177.6	184.3	190.9	197.5	204.1
-10.0	163.3	170.1	176.8	183.5	190.2	196.7	203.3
-8.0	162.7	169.4	176.1	182.8	189.4	196.0	202.5
-6.0	162.0	168.8	175.4	182.1	188.6	195.2	201.7
-4.0	161.4	168.1	174.7	181.3	187.9	194.4	200.9
-2.0	160.7	167.4	174.0	180.6	187.2	193.7	200.1
0.0	160.1	166.7	173.4	179.9	186.4	192.9	199.3
2.0	159.5	166.1	172.7	179.2	185.7	192.2	198.6
4.0	158.8	165.4	172.0	178.5	185.0	191.4	197.8
6.0	158.2	164.8	171.3	177.8	184.3	190.7	197.0
8.0	157.6	164.1	170.7	177.1	183.6	189.9	196.3
10.0	157.0	163.5	170.0	176.4	182.8	189.2	195.5
12.0	156.4	162.9	169.3	175.8	182.1	188.5	194.8
14.0	155.8	162.2	168.7	175.1	181.5	187.8	194.0
16.0	155.2	161.6	168.0	174.4	180.8	187.1	193.3
18.0	154.6	161.0	167.4	173.8	180.1	186.4	192.6
20.0	154.0	160.4	166.8	173.1	179.4	185.7	191.9
22.0	153.4	159.8	166.1	172.4	178.7	185.0	191.2
24.0	152.8	159.2	165.5	171.8	178.1	184.3	190.4
26.0	152.2	158.6	164.9	171.2	177.4	183.6	189.7
28.0	151.6	158.0	164.3	170.5	176.7	182.9	189.0
30.0	151.1	157.4	163.7	169.9	176.1	182.2	188.3
32.0	150.5	156.8	163.0	169.3	175.4	181.6	187.7
34.0	150.0	156.2	162.4	168.6	174.8	180.9	187.0
36.0	149.4	155.6	161.8	168.0	174.1	180.2	186.3
38.0	148.8	155.1	161.3	167.6	173.5	179.6	185.6
40.0	148.3	154.5	160.7	166.8	172.9	178.9	184.9
42.0	147.8	153.9	160.1	166.2	172.3	178.3	184.3
44.0	147.2	153.4	159.5	165.6	171.6	177.6	183.6
46.0	146.7	152.8	158.9	165.0	171.0	177.0	183.0

Table 11-4. Helium Contents Table (SCF/cu ft) - Continued

°F	2200 psig	2300 psig	2400 psig	2500 psig	2600 psig	2700 psig	2800 psig
48.0	146.1	152.3	158.3	164.4	170.4	176.4	182.3
50.0	145.6	151.7	157.8	163.8	169.8	175.7	181.7
52.0	145.1	151.2	157.2	163.2	169.2	175.1	181.0
54.0	144.6	150.6	156.6	162.6	168.6	174.5	180.4
56.0	144.0	150.1	156.1	162.1	168.0	173.9	179.8
58.0	143.5	149.6	155.5	161.5	167.4	173.3	179.1
60.0	143.0	149.0	155.0	160.9	166.8	172.7	178.5
62.0	142.5	148.5	154.4	160.4	166.2	172.1	177.9
64.0	142.0	148.0	153.9	159.8	165.7	171.5	177.3
66.0	141.5	147.5	153.4	159.2	165.1	170.9	176.7
68.0	141.0	146.9	152.8	158.7	164.5	170.3	176.1
70.0	140.5	146.4	152.3	158.1	163.9	169.7	175.4
72.0	140.0	145.9	151.8	157.6	163.4	169.1	174.8
74.0	139.6	145.4	151.3	157.1	162.8	168.6	174.3
76.0	139.1	144.9	150.7	156.5	162.3	168.0	173.7
78.0	138.6	144.4	150.2	156.0	161.7	167.4	173.1
80.0	138.1	143.9	149.7	155.5	161.2	166.8	172.5
82.0	137.6	143.4	149.2	154.9	160.6	166.3	171.9
84.0	137.2	142.9	148.7	154.4	160.1	165.7	171.3
86.0	136.7	142.5	148.2	153.9	159.5	165.2	170.8
88.0	136.2	142.0	147.7	153.4	159.0	164.6	170.2
90.0	135.8	141.5	147.2	152.9	158.5	164.1	169.6
92.0	135.3	141.0	146.7	152.3	158.0	163.5	169.1
94.0	134.9	140.6	146.2	151.8	157.4	163.0	168.5
96.0	134.4	140.1	145.7	151.3	156.9	162.5	168.0
98.0	134.0	139.6	145.2	150.8	156.4	161.9	167.4
100.0	133.5	139.2	144.8	150.3	155.9	161.4	166.9
102.0	133.1	138.7	144.3	149.9	155.4	160.9	166.3
104.0	132.7	138.3	143.8	149.4	154.9	160.4	165.8
106.0	132.2	137.8	143.4	148.9	154.4	159.8	165.3
108.0	131.8	137.3	142.9	148.4	153.9	159.3	164.7
110.0	131.4	136.9	142.4	147.9	153.4	158.8	164.2
112.0	130.9	136.5	142.0	147.4	152.9	158.3	163.7
114.0	130.5	136.0	141.5	147.0	152.4	157.8	163.2
116.0	130.1	135.6	141.1	146.5	151.9	157.3	162.6
118.0	129.7	135.1	140.6	146.0	151.4	156.8	162.1
120.0	129.2	134.7	140.1	145.6	150.9	156.3	161.6
122.0	128.8	134.3	139.7	145.1	150.5	155.8	161.1
124.0	128.4	133.9	139.3	144.6	150.0	155.3	160.6
126.0	128.0	133.4	138.8	144.2	149.5	154.8	160.1
128.0	127.6	133.0	138.4	143.7	149.0	154.3	159.6
130.0	127.2	132.6	137.9	143.3	148.6	153.9	159.1

Table 11-4. Helium Contents Table (SCF/cu ft) - Continued

°F	2900 psig	3000 psig	3100 psig	3200 psig	3300 psig	3400 psig	3500 psig
-40.0	223.0	229.8	236.6	243.3	250.0	256.6	263.2
-38.0	222.1	228.9	235.6	242.3	248.9	255.5	262.1
-36.0	221.2	227.9	234.6	241.3	247.9	254.5	261.0
-34.0	220.2	227.0	233.7	240.3	246.9	253.5	260.0
-32.0	219.3	226.0	232.7	239.3	245.9	252.4	258.9
-30.0	218.4	225.1	231.8	238.4	244.9	251.4	257.9
-28.0	217.5	224.2	230.8	237.4	243.9	250.4	256.8
-26.0	216.6	223.3	229.9	236.4	242.9	249.4	255.8
-24.0	215.8	222.4	229.0	235.5	242.0	248.4	254.8
-22.0	214.9	221.5	228.0	234.5	241.0	247.4	253.8
-20.0	214.0	220.6	227.1	233.6	240.0	246.4	252.8
-18.0	213.2	219.7	226.2	232.7	239.1	245.5	251.8
-16.0	212.3	218.8	225.3	231.8	238.1	244.5	250.8
-14.0	211.5	218.0	224.4	230.8	237.2	243.5	249.8
-12.0	210.6	217.1	223.5	229.9	236.3	242.6	248.9
-10.0	209.8	216.2	222.7	229.0	235.4	241.6	247.9
-8.0	209.0	215.4	221.8	228.1	234.4	240.7	246.9
-6.0	208.1	214.6	220.9	227.3	233.5	239.8	246.0
-4.0	207.3	213.7	220.1	226.4	232.6	238.9	245.1
-2.0	206.5	212.9	219.2	225.5	231.8	238.0	244.1
0.0	205.7	212.1	218.4	224.6	230.9	237.0	243.2
2.0	204.9	211.3	217.5	223.8	230.0	236.2	242.3
4.0	204.1	210.4	216.7	222.9	229.1	235.3	241.4
6.0	203.4	209.6	215.9	222.1	228.2	234.4	240.5
8.0	202.6	208.8	215.1	221.2	227.4	233.5	239.6
10.0	201.8	208.1	214.3	220.4	226.5	232.6	238.7
12.0	201.0	207.3	213.4	219.6	225.7	231.8	237.8
14.0	200.3	206.5	212.6	218.8	224.9	230.9	236.9
16.0	199.5	205.7	211.9	218.0	224.0	230.0	236.0
18.0	198.8	204.9	211.1	217.1	223.2	229.2	235.2
20.0	198.0	204.2	210.3	216.3	222.4	228.4	234.3
22.0	197.3	203.4	209.5	215.6	221.6	227.5	233.5
24.0	196.6	202.7	208.7	214.8	220.7	226.7	232.6
26.0	195.9	201.9	208.0	214.0	219.9	225.9	231.8
28.0	195.1	201.2	207.2	213.2	219.1	225.1	230.9
30.0	194.4	200.5	206.5	212.4	218.4	224.2	230.1
32.0	193.7	199.7	205.7	211.7	217.6	223.4	229.3
34.0	193.0	199.0	205.0	210.9	216.8	222.6	228.5
36.0	192.3	198.3	204.2	210.1	216.0	221.9	227.7
38.0	191.6	197.6	203.5	209.4	215.2	221.1	226.9
40.0	190.9	196.9	202.8	208.6	214.5	220.3	226.1
42.0	190.2	196.2	202.1	207.9	213.7	219.5	225.3
44.0	189.6	195.5	201.3	207.2	213.0	218.7	224.5
46.0	188.9	194.8	200.6	206.4	212.2	218.0	223.7

Table 11-4. Helium Contents Table (SCF/cu ft) - Continued

°F	2900 psig	3000 psig	3100 psig	3200 psig	3300 psig	3400 psig	3500 psig
48.0	188.2	194.1	199.9	205.7	211.5	217.2	222.9
50.0	187.6	193.4	199.2	205.0	210.7	216.5	222.1
52.0	186.9	192.7	198.5	204.3	210.0	215.7	221.4
54.0	186.2	192.0	197.8	203.6	209.3	215.0	220.6
56.0	185.6	191.4	197.1	202.9	208.6	214.2	219.9
58.0	184.9	190.7	196.5	202.2	207.8	213.5	219.1
60.0	184.3	190.1	195.8	201.5	207.1	212.8	218.4
62.0	183.7	189.4	195.1	200.8	206.4	212.0	217.6
64.0	183.0	188.7	194.4	200.1	205.7	211.3	216.9
66.0	182.4	188.1	193.8	199.4	205.0	210.6	216.2
68.0	181.8	187.5	193.1	198.7	204.3	209.9	215.4
70.0	181.2	186.8	192.5	198.1	203.6	209.2	214.7
72.0	180.5	186.2	191.8	197.4	203.0	208.5	214.0
74.0	179.9	185.6	191.2	196.7	202.3	207.8	213.3
76.0	179.3	184.9	190.5	196.1	201.6	207.1	212.6
78.0	178.7	184.3	189.9	195.4	200.9	206.4	211.9
80.0	178.1	183.7	189.3	194.8	200.3	205.7	211.2
82.0	177.5	183.1	188.6	194.1	199.6	205.1	210.5
84.0	176.9	182.5	188.0	193.5	199.0	204.4	209.8
86.0	176.3	181.9	187.4	192.9	198.3	203.7	209.1
88.0	175.8	181.3	186.8	192.2	197.7	203.1	208.4
90.0	175.2	180.7	186.2	191.6	197.0	202.4	207.8
92.0	174.6	180.1	185.5	191.0	196.4	201.7	207.1
94.0	174.0	179.5	184.9	190.4	195.7	201.1	206.4
96.0	173.5	178.9	184.3	189.7	195.1	200.4	205.8
98.0	172.9	178.3	183.7	189.1	194.5	199.8	205.1
100.0	172.3	177.8	183.2	188.5	193.9	199.2	204.4
102.0	171.8	177.2	182.6	187.9	193.2	198.5	203.8
104.0	171.2	176.6	182.0	187.3	192.6	197.9	203.2
106.0	170.7	176.0	181.4	186.7	192.0	197.3	202.5
108.0	170.1	175.5	180.8	186.1	191.4	196.7	201.9
110.0	169.6	174.9	180.2	185.5	190.8	196.0	201.2
112.0	169.0	174.4	179.7	184.9	190.2	195.4	200.6
114.0	168.5	173.8	179.1	184.4	189.6	194.8	200.0
116.0	168.0	173.3	178.5	183.8	189.0	194.2	199.4
118.0	167.4	172.7	178.0	183.2	188.4	193.6	198.7
120.0	166.9	172.2	177.4	182.6	187.8	193.0	198.1
122.0	166.4	171.6	176.9	182.1	187.3	192.4	197.5
124.0	165.9	171.1	176.3	181.5	186.7	191.8	196.9
126.0	165.4	170.6	175.8	181.0	186.1	191.2	196.3
128.0	164.8	170.1	175.2	180.4	185.5	190.6	195.7
130.0	164.3	169.5	174.7	179.8	185.0	190.1	195.1

Table 11-4. Helium Contents Table (SCF/cu ft) - Continued

°F	3600 psig	3700 psig	3800 psig	3900 psig	4000 psig	4100 psig	4200 psig
-40.0	269.7	276.2	282.6	289.0	295.4	301.7	307.9
-38.0	268.6	275.1	281.5	287.8	294.2	300.5	306.7
-36.0	267.5	273.9	280.3	286.7	293.0	299.3	305.5
-34.0	266.4	272.8	279.2	285.5	291.8	298.1	304.3
-32.0	265.3	271.7	278.1	284.4	290.7	296.9	303.1
-30.0	264.3	270.7	277.0	283.3	289.5	295.7	301.9
-28.0	263.2	269.6	275.9	282.2	288.4	294.6	300.7
-26.0	262.2	268.5	274.8	281.1	287.3	293.4	299.6
-24.0	261.1	267.5	273.7	280.0	286.1	292.3	298.4
-22.0	260.1	266.4	272.7	278.9	285.0	291.2	297.2
-20.0	259.1	265.4	271.6	277.8	283.9	290.0	296.1
-18.0	258.1	264.3	270.5	276.7	282.8	288.9	295.0
-16.0	257.1	263.3	269.5	275.6	281.7	287.8	293.8
-14.0	256.1	262.3	268.4	274.6	280.7	286.7	292.7
-12.0	255.1	261.3	267.4	273.5	279.6	285.6	291.6
-10.0	254.1	260.3	266.4	272.5	278.5	284.5	290.5
-8.0	253.1	259.3	265.4	271.5	277.5	283.5	289.4
-6.0	252.2	258.3	264.4	270.4	276.4	282.4	288.3
-4.0	251.2	257.3	263.4	269.4	275.4	281.4	287.3
-2.0	250.2	256.3	262.4	268.4	274.4	280.3	286.2
0.0	249.3	255.4	261.4	267.4	273.3	279.3	285.1
2.0	248.4	254.4	260.4	266.4	272.3	278.2	284.1
4.0	247.4	253.5	259.5	265.4	271.3	277.2	283.1
6.0	246.5	252.5	258.5	264.4	270.3	276.2	282.0
8.0	245.6	251.6	257.5	263.5	269.3	275.2	281.0
10.0	244.7	250.7	256.6	262.5	268.3	274.2	280.0
12.0	243.8	249.7	255.6	261.5	267.4	273.2	279.0
14.0	242.9	248.8	254.7	260.6	266.4	272.2	278.0
16.0	242.0	247.9	253.8	259.6	265.4	271.2	277.0
18.0	241.1	247.0	252.9	258.7	264.5	270.2	276.0
20.0	240.2	246.1	251.9	257.8	263.5	269.3	275.0
22.0	239.4	245.2	251.0	256.8	262.6	268.3	274.0
24.0	238.5	244.3	250.1	255.9	261.7	267.4	273.0
26.0	237.6	243.5	249.2	255.0	260.7	266.4	272.1
28.0	236.8	242.6	248.4	254.1	259.8	265.5	271.1
30.0	235.9	241.7	247.5	253.2	258.9	264.5	270.2
32.0	235.1	240.9	246.6	252.3	258.0	263.6	269.2
34.0	234.3	240.0	245.7	251.4	257.1	262.7	268.3
36.0	233.4	239.2	244.9	250.5	256.2	261.8	267.4
38.0	232.6	238.3	244.0	249.7	255.3	260.9	266.4
40.0	231.8	237.5	243.2	248.8	254.4	260.0	265.5
42.0	231.0	236.7	242.3	247.9	253.5	259.1	264.6
44.0	230.2	235.8	241.5	247.1	252.6	258.2	263.7
46.0	229.4	235.0	240.6	246.2	251.8	257.3	262.8

Table 11-4. Helium Contents Table (SCF/cu ft) - Continued

°F	3600 psig	3700 psig	3800 psig	3900 psig	4000 psig	4100 psig	4200 psig
48.0	228.6	234.2	239.8	245.4	250.9	256.4	261.9
50.0	227.8	233.4	239.0	244.5	250.1	255.6	261.0
52.0	227.0	232.6	238.2	243.7	249.2	254.7	260.1
54.0	226.2	231.8	237.4	242.9	248.4	253.8	259.3
56.0	225.5	231.0	236.6	242.1	247.5	253.0	258.4
58.0	224.7	230.2	235.8	241.2	246.7	252.1	257.5
60.0	223.9	229.5	235.0	240.4	245.9	251.3	256.7
62.0	223.2	228.7	234.2	239.6	245.1	250.5	255.8
64.0	222.4	227.9	233.4	238.8	244.2	249.6	255.0
66.0	221.7	227.2	232.6	238.0	243.4	248.8	254.1
68.0	220.9	226.4	231.8	237.2	242.6	248.0	253.3
70.0	220.2	225.6	231.1	236.5	241.8	247.2	252.5
72.0	219.5	224.9	230.3	235.7	241.0	246.4	251.7
74.0	218.7	224.2	229.5	234.9	240.2	245.6	250.8
76.0	218.0	223.4	228.8	234.1	239.5	244.8	250.0
78.0	217.3	222.7	228.0	233.4	238.7	244.0	249.2
80.0	216.6	222.0	227.3	232.6	237.9	243.2	248.4
82.0	215.9	221.2	226.6	231.9	237.1	242.4	247.6
84.0	215.2	220.5	225.8	231.1	236.4	241.6	246.8
86.0	214.5	219.8	225.1	230.4	235.6	240.8	246.0
88.0	213.8	219.1	224.4	229.6	234.9	240.1	245.3
90.0	213.1	218.4	223.7	228.9	234.1	239.3	244.5
92.0	212.4	217.7	222.9	228.2	233.4	238.6	243.7
94.0	211.7	217.0	222.2	227.4	232.6	237.8	242.9
96.0	211.0	216.3	221.5	226.7	231.9	237.1	242.2
98.0	210.4	215.6	220.8	226.0	231.2	236.3	241.4
100.0	209.7	214.9	220.1	225.3	230.4	235.6	240.7
102.0	209.0	214.2	219.4	224.6	229.7	234.8	239.9
104.0	208.4	213.6	218.7	223.9	229.0	234.1	239.2
106.0	207.7	212.9	218.1	223.2	228.3	233.4	238.4
108.0	207.1	212.2	217.4	222.5	227.6	232.7	237.7
110.0	206.4	211.6	216.7	221.8	226.9	231.9	237.0
112.0	205.8	210.9	216.0	221.1	226.2	231.2	236.2
114.0	205.1	210.3	215.4	220.4	225.5	230.5	235.5
116.0	204.5	209.6	214.7	219.8	224.8	229.8	234.8
118.0	203.9	209.0	214.0	219.1	224.1	229.1	234.1
120.0	203.2	208.3	213.4	218.4	223.4	228.4	233.4
122.0	202.6	207.7	212.7	217.8	222.8	227.7	232.7
124.0	202.0	207.1	212.1	217.1	222.1	227.0	232.0
126.0	201.4	206.4	211.5	216.4	221.4	226.4	231.3
128.0	200.8	205.8	210.8	215.8	220.8	225.7	230.6
130.0	200.2	205.2	210.2	215.1	220.1	225.0	229.9

Table 11-4. Helium Contents Table (SCF/cu ft) - Continued

°F	4300 psig	4400 psig	4500 psig	4600 psig	4700 psig	4800 psig	4900 psig
-40.0	314.2	320.3	326.5	332.6	338.7	344.7	350.7
-38.0	312.9	319.1	325.2	331.3	337.3	343.3	349.3
-36.0	311.7	317.8	323.9	330.0	336.0	342.0	348.0
-34.0	310.5	316.6	322.7	328.7	334.7	340.7	346.6
-32.0	309.2	315.3	321.4	327.4	333.4	339.4	345.3
-30.0	308.0	314.1	320.2	326.2	332.1	338.1	344.0
-28.0	306.8	312.9	318.9	324.9	330.9	336.8	342.7
-26.0	305.6	311.7	317.7	323.7	329.6	335.5	341.4
-24.0	304.5	310.5	316.5	322.4	328.4	334.2	340.1
-22.0	303.3	309.3	315.3	321.2	327.1	333.0	338.8
-20.0	302.1	308.1	314.1	320.0	325.9	331.7	337.5
-18.0	301.0	307.0	312.9	318.8	324.6	330.5	336.3
-16.0	299.8	305.8	311.7	317.6	323.4	329.2	335.0
-14.0	298.7	304.6	310.5	316.4	322.2	328.0	333.8
-12.0	297.6	303.5	309.4	315.2	321.0	326.8	332.5
-10.0	296.5	302.4	308.2	314.0	319.8	325.6	331.3
-8.0	295.3	301.2	307.1	312.9	318.7	324.4	330.1
-6.0	294.2	300.1	305.9	311.7	317.5	323.2	328.9
-4.0	293.2	299.0	304.8	310.6	316.3	322.0	327.7
-2.0	292.1	297.9	303.7	309.4	315.2	320.9	326.5
0.0	291.0	296.8	302.6	308.3	314.0	319.7	325.3
2.0	289.9	295.7	301.5	307.2	312.9	318.5	324.2
4.0	288.9	294.6	300.4	306.1	311.8	317.4	323.0
6.0	287.8	293.6	299.3	305.0	310.6	316.3	321.9
8.0	286.8	292.5	298.2	303.9	309.5	315.1	320.7
10.0	285.7	291.5	297.1	302.8	308.4	314.0	319.6
12.0	284.7	290.4	296.1	301.7	307.3	312.9	318.4
14.0	283.7	289.4	295.0	300.6	306.2	311.8	317.3
16.0	282.7	288.3	294.0	299.6	305.2	310.7	316.2
18.0	281.7	287.3	292.9	298.5	304.1	309.6	315.1
20.0	280.7	286.3	291.9	297.5	303.0	308.5	314.0
22.0	279.7	285.3	290.9	296.4	302.0	307.5	312.9
24.0	278.7	284.3	289.9	295.4	300.9	306.4	311.8
26.0	277.7	283.3	288.8	294.4	299.9	305.3	310.8
28.0	276.7	282.3	287.8	293.3	298.8	304.3	309.7
30.0	275.8	281.3	286.8	292.3	297.8	303.2	308.6
32.0	274.8	280.3	285.8	291.3	296.8	302.2	307.6
34.0	273.8	279.4	284.9	290.3	295.8	301.2	306.5
36.0	272.9	278.4	283.9	289.3	294.7	300.1	305.5
38.0	272.0	277.4	282.9	288.3	293.7	299.1	304.5
40.0	271.0	276.5	281.9	287.4	292.8	298.1	303.4
42.0	270.1	275.6	281.0	286.4	291.8	297.1	302.4
44.0	269.2	274.6	280.0	285.4	290.8	296.1	301.4
46.0	268.3	273.7	279.1	284.5	289.8	295.1	300.4

Table 11-4. Helium Contents Table (SCF/cu ft) - Continued

°F	4300 psig	4400 psig	4500 psig	4600 psig	4700 psig	4800 psig	4900 psig
48.0	267.4	272.8	278.2	283.5	288.8	294.1	299.4
50.0	266.5	271.9	277.2	282.6	287.9	293.2	298.4
52.0	265.6	270.9	276.3	281.6	286.9	292.2	297.4
54.0	264.7	270.0	275.4	280.7	286.0	291.2	296.5
56.0	263.8	269.1	274.5	279.8	285.0	290.3	295.5
58.0	262.9	268.2	273.6	278.8	284.1	289.3	294.5
60.0	262.0	267.4	272.7	277.9	283.2	288.4	293.6
62.0	261.2	266.5	271.8	277.0	282.2	287.4	292.6
64.0	260.3	265.6	270.9	276.1	281.3	286.5	291.7
66.0	259.5	264.7	270.0	275.2	280.4	285.6	290.7
68.0	258.6	263.9	269.1	274.3	279.5	284.7	289.8
70.0	257.8	263.0	268.2	273.4	278.6	283.7	288.9
72.0	256.9	262.2	267.4	272.6	277.7	282.8	287.9
74.0	256.1	261.3	266.5	271.7	276.8	281.9	287.0
76.0	255.3	260.5	265.7	270.8	275.9	281.0	286.1
78.0	254.4	259.6	264.8	269.9	275.1	280.1	285.2
80.0	253.6	258.8	264.0	269.1	274.2	279.3	284.3
82.0	252.8	258.0	263.1	268.2	273.3	278.4	283.4
84.0	252.0	257.2	262.3	267.4	272.5	277.5	282.5
86.0	251.2	256.3	261.5	266.5	271.6	276.6	281.6
88.0	250.4	255.5	260.6	265.7	270.8	275.8	280.8
90.0	249.6	254.7	259.8	264.9	269.9	274.9	279.9
92.0	248.8	253.9	259.0	264.0	269.1	274.1	279.0
94.0	248.0	253.1	258.2	263.2	268.2	273.2	278.2
96.0	247.3	252.3	257.4	262.4	267.4	272.4	277.3
98.0	246.5	251.6	256.6	261.6	266.6	271.5	276.5
100.0	245.7	250.8	255.8	260.8	265.8	270.7	275.6
102.0	245.0	250.0	255.0	260.0	264.9	269.9	274.8
104.0	244.2	249.2	254.2	259.2	264.1	269.1	274.0
106.0	243.5	248.5	253.4	258.4	263.3	268.2	273.1
108.0	242.7	247.7	252.7	257.6	262.5	267.4	272.3
110.0	242.0	246.9	251.9	256.8	261.7	266.6	271.5
112.0	241.2	246.2	251.1	256.1	260.9	265.8	270.7
114.0	240.5	245.5	250.4	255.3	260.2	265.0	269.9
116.0	239.8	244.7	249.6	254.5	259.4	264.2	269.0
118.0	239.0	244.0	248.9	253.8	258.6	263.4	268.2
120.0	238.3	243.2	248.1	253.0	257.8	262.7	267.5
122.0	237.6	242.5	247.4	252.2	257.1	261.9	266.7
124.0	236.9	241.8	246.6	251.5	256.3	261.1	265.9
126.0	236.2	241.1	245.9	250.7	255.5	260.3	265.1
128.0	235.5	240.3	245.2	250.0	254.8	259.6	264.3
130.0	234.8	239.6	244.5	249.3	254.0	258.8	263.5

Table 11-4. Helium Contents Table (SCF/cu ft) - Continued

°F	5000 psig	5100 psig	5200 psig	5300 psig	5400 psig	5500 psig	5600 psig
-40.0	356.6	362.5	368.4	374.2	380.0	385.8	391.5
-38.0	355.2	361.1	367.0	372.8	378.6	384.3	390.0
-36.0	353.9	359.7	365.6	371.4	377.2	382.9	388.6
-34.0	352.5	358.4	364.2	370.0	375.7	381.4	387.1
-32.0	351.2	357.0	362.8	368.6	374.3	380.0	385.7
-30.0	349.8	355.7	361.4	367.2	372.9	378.6	384.2
-28.0	348.5	354.3	360.1	365.8	371.5	377.2	382.8
-26.0	347.2	353.0	358.7	364.4	370.1	375.8	381.4
-24.0	345.9	351.7	357.4	363.1	368.8	374.4	380.0
-22.0	344.6	350.3	356.1	361.7	367.4	373.0	378.6
-20.0	343.3	349.0	354.7	360.4	366.0	371.6	377.2
-18.0	342.0	347.7	353.4	359.1	364.7	370.3	375.8
-16.0	340.8	346.5	352.1	357.8	363.4	368.9	374.5
-14.0	339.5	345.2	350.8	356.5	362.0	367.6	373.1
-12.0	338.2	343.9	349.6	355.2	360.7	366.3	371.8
-10.0	337.0	342.7	348.3	353.9	359.4	364.9	370.4
-8.0	335.8	341.4	347.0	352.6	358.1	363.6	369.1
-6.0	334.6	340.2	345.8	351.3	356.8	362.3	367.8
-4.0	333.3	338.9	344.5	350.1	355.6	361.0	366.5
-2.0	332.1	337.7	343.3	348.8	354.3	359.8	365.2
0.0	330.9	336.5	342.1	347.6	353.0	358.5	363.9
2.0	329.8	335.3	340.8	346.3	351.8	357.2	362.6
4.0	328.6	334.1	339.6	345.1	350.6	356.0	361.4
6.0	327.4	332.9	338.4	343.9	349.3	354.7	360.1
8.0	326.3	331.8	337.2	342.7	348.1	353.5	358.8
10.0	325.1	330.6	336.1	341.5	346.9	352.3	357.6
12.0	324.0	329.4	334.9	340.3	345.7	351.0	356.4
14.0	322.8	328.3	333.7	339.1	344.5	349.8	355.1
16.0	321.7	327.1	332.6	337.9	343.3	348.6	353.9
18.0	320.6	326.0	331.4	336.8	342.1	347.4	352.7
20.0	319.5	324.9	330.3	335.6	340.9	346.2	351.5
22.0	318.4	323.8	329.1	334.5	339.8	345.1	350.3
24.0	317.3	322.6	328.0	333.3	338.6	343.9	349.1
26.0	316.2	321.5	326.9	332.2	337.5	342.7	348.0
28.0	315.1	320.4	325.8	331.1	336.3	341.6	346.8
30.0	314.0	319.4	324.7	330.0	335.2	340.4	345.6
32.0	312.9	318.3	323.6	328.8	334.1	339.3	344.5
34.0	311.9	317.2	322.5	327.7	333.0	338.2	343.3
36.0	310.8	316.1	321.4	326.6	331.9	337.0	342.2
38.0	309.8	315.1	320.3	325.6	330.8	335.9	341.1
40.0	308.7	314.0	319.3	324.5	329.7	334.8	339.9
42.0	307.7	313.0	318.2	323.4	328.6	333.7	338.8
44.0	306.7	311.9	317.1	322.3	327.5	332.6	337.7
46.0	305.7	310.9	316.1	321.3	326.4	331.5	336.6

Table 11-4. Helium Contents Table (SCF/cu ft) - Continued

°F	5000 psig	5100 psig	5200 psig	5300 psig	5400 psig	5500 psig	5600 psig
48.0	304.7	309.9	315.1	320.2	325.3	330.5	335.5
50.0	303.6	308.8	314.0	319.2	324.3	329.4	334.4
52.0	302.7	307.8	313.0	318.1	323.2	328.3	333.4
54.0	301.7	306.8	312.0	317.1	322.2	327.3	332.3
56.0	300.7	305.8	311.0	316.1	321.1	326.2	331.2
58.0	299.7	304.8	310.0	315.1	320.1	325.2	330.2
60.0	298.7	303.9	309.0	314.0	319.1	324.1	329.1
62.0	297.8	302.9	308.0	313.0	318.1	323.1	328.1
64.0	296.8	301.9	307.0	312.0	317.1	322.1	327.0
66.0	295.8	300.9	306.0	311.0	316.1	321.0	326.0
68.0	294.9	300.0	305.0	310.1	315.1	320.0	325.0
70.0	294.0	299.0	304.1	309.1	314.1	319.0	324.0
72.0	293.0	298.1	303.1	308.1	313.1	318.0	322.9
74.0	292.1	297.1	302.1	307.1	312.1	317.0	321.9
76.0	291.2	296.2	301.2	306.2	311.1	316.0	320.9
78.0	290.2	295.3	300.2	305.2	310.1	315.1	319.9
80.0	289.3	294.3	299.3	304.3	309.2	314.1	319.0
82.0	288.4	293.4	298.4	303.3	308.2	313.1	318.0
84.0	287.5	292.5	297.4	302.4	307.3	312.1	317.0
86.0	286.6	291.6	296.5	301.4	306.3	311.2	316.0
88.0	285.7	290.7	295.6	300.5	305.4	310.2	315.1
90.0	284.9	289.8	294.7	299.6	304.5	309.3	314.1
92.0	284.0	288.9	293.8	298.7	303.5	308.4	313.2
94.0	283.1	288.0	292.9	297.8	302.6	307.4	312.2
96.0	282.2	287.1	292.0	296.9	301.7	306.5	311.3
98.0	281.4	286.3	291.1	296.0	300.8	305.6	310.3
100.0	280.5	285.4	290.2	295.1	299.9	304.7	309.4
102.0	279.7	284.5	289.4	294.2	299.0	303.7	308.5
104.0	278.8	283.7	288.5	293.3	298.1	302.8	307.6
106.0	278.0	282.8	287.6	292.4	297.2	301.9	306.7
108.0	277.1	282.0	286.8	291.5	296.3	301.0	305.7
110.0	276.3	281.1	285.9	290.7	295.4	300.1	304.8
112.0	275.5	280.3	285.1	289.8	294.5	299.3	303.9
114.0	274.7	279.5	284.2	289.0	293.7	298.4	303.1
116.0	273.8	278.6	283.4	288.1	292.8	297.5	302.2
118.0	273.0	277.8	282.5	287.3	292.0	296.6	301.3
120.0	272.2	277.0	281.7	286.4	291.1	295.8	300.4
122.0	271.4	276.2	280.9	285.6	290.3	294.9	299.5
124.0	270.6	275.4	280.1	284.7	289.4	294.1	298.7
126.0	269.8	274.6	279.2	283.9	288.6	293.2	297.8
128.0	269.0	273.8	278.4	283.1	287.7	292.4	297.0
130.0	268.3	273.0	277.6	282.3	286.9	291.5	296.1

Table 11-4. Helium Contents Table (SCF/cu ft) - Continued

°F	5700 psig	5800 psig	5900 psig	6000 psig
-40.0	397.2	402.9	408.5	414.1
-38.0	395.7	401.4	407.0	412.6
-36.0	394.2	399.9	405.5	411.0
-34.0	392.8	398.4	404.0	409.5
-32.0	391.3	396.9	402.5	408.0
-30.0	389.8	395.4	401.0	406.5
-28.0	388.4	394.0	399.5	405.0
-26.0	387.0	392.5	398.0	403.5
-24.0	385.6	391.1	396.6	402.1
-22.0	384.1	389.7	395.1	400.6
-20.0	382.7	388.2	393.7	399.2
-18.0	381.4	386.8	392.3	397.7
-16.0	380.0	385.4	390.9	396.3
-14.0	378.6	384.1	389.5	394.9
-12.0	377.2	382.7	388.1	393.5
-10.0	375.9	381.3	386.7	392.1
-8.0	374.6	380.0	385.4	390.7
-6.0	373.2	378.6	384.0	389.3
-4.0	371.9	377.3	382.6	388.0
-2.0	370.6	376.0	381.3	386.6
0.0	369.3	374.6	380.0	385.3
2.0	368.0	373.3	378.7	383.9
4.0	366.7	372.0	377.3	382.6
6.0	365.4	370.8	376.0	381.3
8.0	364.2	369.5	374.7	380.0
10.0	362.9	368.2	373.5	378.7
12.0	361.7	366.9	372.2	377.4
14.0	360.4	365.7	370.9	376.1
16.0	359.2	364.4	369.7	374.8
18.0	358.0	363.2	368.4	373.6
20.0	356.8	362.0	367.2	372.3
22.0	355.6	360.8	365.9	371.1
24.0	354.4	359.5	364.7	369.8
26.0	353.2	358.3	363.5	368.6
28.0	352.0	357.1	362.3	367.4
30.0	350.8	356.0	361.1	366.2
32.0	349.6	354.8	359.9	365.0
34.0	348.5	353.6	358.7	363.8
36.0	347.3	352.4	357.5	362.6
38.0	346.2	351.3	356.3	361.4
40.0	345.1	350.1	355.2	360.2
42.0	343.9	349.0	354.0	359.0
44.0	342.8	347.9	352.9	357.9
46.0	341.7	346.7	351.7	356.7

Table 11-4. Helium Contents Table (SCF/cu ft) - Continued

°F	5700 psig	5800 psig	5900 psig	6000 psig
48.0	340.6	345.6	350.6	355.6
50.0	339.5	344.5	349.5	354.5
52.0	338.4	343.4	348.4	353.3
54.0	337.3	342.3	347.3	352.2
56.0	336.2	341.2	346.2	351.1
58.0	335.2	340.1	345.1	350.0
60.0	334.1	339.0	344.0	348.9
62.0	333.0	338.0	342.9	347.8
64.0	332.0	336.9	341.8	346.7
66.0	330.9	335.9	340.7	345.6
68.0	329.9	334.8	339.7	344.5
70.0	328.9	333.8	338.6	343.5
72.0	327.8	332.7	337.6	342.4
74.0	326.8	331.7	336.5	341.4
76.0	325.8	330.7	335.5	340.3
78.0	324.8	329.7	334.5	339.3
80.0	323.8	328.6	333.4	338.2
82.0	322.8	327.6	332.4	337.2
84.0	321.8	326.6	331.4	336.2
86.0	320.8	325.6	330.4	335.2
88.0	319.9	324.7	329.4	334.2
90.0	318.9	323.7	328.4	333.1
92.0	317.9	322.7	327.4	332.1
94.0	317.0	321.7	326.5	331.2
96.0	316.0	320.8	325.5	330.2
98.0	315.1	319.8	324.5	329.2
100.0	314.1	318.9	323.5	328.2
102.0	313.2	317.9	322.6	327.2
104.0	312.3	317.0	321.6	326.3
106.0	311.4	316.0	320.7	325.3
108.0	310.4	315.1	319.7	324.4
110.0	309.5	314.2	318.8	323.4
112.0	308.6	313.3	317.9	322.5
114.0	307.7	312.3	317.0	321.6
116.0	306.8	311.4	316.0	320.6
118.0	305.9	310.5	315.1	319.7
120.0	305.0	309.6	314.2	318.8
122.0	304.2	308.7	313.3	317.9
124.0	303.3	307.9	312.4	317.0
126.0	302.4	307.0	311.5	316.1
128.0	301.5	306.1	310.6	315.2
130.0	300.7	305.2	309.8	314.3

Table 11-5. Hydrogen Contents Table (SCF/cu ft)

°F	100 psig	200 psig	300 psig	400 psig	500 psig	600 psig	700 psig
-40.0	9.803	18.26	26.64	34.94	43.16	51.31	59.37
-38.0	9.756	18.18	26.52	34.78	42.96	51.06	59.09
-36.0	9.710	18.09	26.39	34.61	42.76	50.83	58.82
-34.0	9.665	18.01	26.27	34.45	42.56	50.59	58.55
-32.0	9.620	17.92	26.15	34.29	42.36	50.36	58.28
-30.0	9.575	17.84	26.03	34.14	42.17	50.13	58.01
-28.0	9.531	17.76	25.91	33.98	41.98	49.90	57.74
-26.0	9.487	17.68	25.79	33.82	41.78	49.67	57.48
-24.0	9.443	17.59	25.67	33.67	41.59	49.44	57.22
-22.0	9.400	17.51	25.55	33.52	41.41	49.22	56.97
-20.0	9.358	17.44	25.44	33.37	41.22	49.00	56.71
-18.0	9.315	17.36	25.32	33.22	41.04	48.78	56.46
-16.0	9.274	17.28	25.21	33.07	40.85	48.57	56.21
-14.0	9.232	17.20	25.10	32.92	40.67	48.35	55.96
-12.0	9.191	17.12	24.99	32.77	40.49	48.14	55.71
-10.0	9.150	17.05	24.88	32.63	40.31	47.93	55.47
-8.0	9.110	16.97	24.77	32.49	40.14	47.72	55.23
-6.0	9.070	16.90	24.66	32.35	39.96	47.51	54.99
-4.0	9.030	16.83	24.55	32.20	39.79	47.30	54.75
-2.0	8.991	16.75	24.44	32.07	39.62	47.10	54.52
0.0	8.952	16.68	24.34	31.93	39.45	46.90	54.28
2.0	8.913	16.61	24.23	31.79	39.28	46.70	54.05
4.0	8.875	16.54	24.13	31.65	39.11	46.50	53.82
6.0	8.837	16.47	24.03	31.52	38.95	46.30	53.60
8.0	8.799	16.40	23.93	31.39	38.78	46.11	53.37
10.0	8.761	16.33	23.82	31.25	38.62	45.92	53.15
12.0	8.724	16.26	23.72	31.12	38.46	45.72	52.93
14.0	8.688	16.19	23.62	30.99	38.30	45.53	52.71
16.0	8.651	16.12	23.53	30.86	38.14	45.35	52.49
18.0	8.615	16.05	23.43	30.74	37.98	45.16	52.27
20.0	8.579	15.99	23.33	30.61	37.82	44.97	52.06
22.0	8.544	15.92	23.23	30.48	37.67	44.79	51.85
24.0	8.509	15.86	23.14	30.36	37.51	44.61	51.64
26.0	8.474	15.79	23.05	30.23	37.36	44.43	51.43
28.0	8.439	15.73	22.95	30.11	37.21	44.25	51.22
30.0	8.405	15.66	22.86	29.99	37.06	44.07	51.02
32.0	8.371	15.60	22.77	29.87	36.91	43.89	50.81
34.0	8.337	15.54	22.67	29.75	36.76	43.72	50.61
36.0	8.303	15.47	22.58	29.63	36.62	43.54	50.41
38.0	8.270	15.41	22.49	29.51	36.47	43.37	50.21
40.0	8.237	15.35	22.40	29.40	36.33	43.20	50.01
42.0	8.204	15.29	22.32	29.28	36.19	43.03	49.82
44.0	8.172	15.23	22.23	29.17	36.04	42.86	49.62

Table 11-5. Hydrogen Contents Table (SCF/cu ft) - Continued

°F	100 psig	200 psig	300 psig	400 psig	500 psig	600 psig	700 psig
46.0	8.139	15.17	22.14	29.05	35.90	42.70	49.43
48.0	8.108	15.11	22.05	28.94	35.76	42.53	49.24
50.0	8.076	15.05	21.97	28.83	35.63	42.37	49.05
52.0	8.044	14.99	21.88	28.71	35.49	42.20	48.86
54.0	8.013	14.94	21.80	28.60	35.35	42.04	48.68
56.0	7.982	14.88	21.72	28.49	35.22	41.88	48.49
58.0	7.951	14.82	21.63	28.39	35.08	41.72	48.31
60.0	7.921	14.76	21.55	28.28	34.95	41.57	48.13
62.0	7.891	14.71	21.47	28.17	34.82	41.41	47.94
64.0	7.861	14.65	21.39	28.06	34.69	41.25	47.77
66.0	7.831	14.60	21.31	27.96	34.56	41.10	47.59
68.0	7.801	14.54	21.23	27.85	34.43	40.95	47.41
70.0	7.772	14.49	21.15	27.75	34.30	40.79	47.24
72.0	7.743	14.43	21.07	27.65	34.17	40.64	47.06
74.0	7.714	14.38	20.99	27.54	34.05	40.49	46.89
76.0	7.685	14.33	20.91	27.44	33.92	40.34	46.72
78.0	7.656	14.27	20.83	27.34	33.80	40.20	46.55
80.0	7.628	14.22	20.76	27.24	33.67	40.05	46.38
82.0	7.600	14.17	20.68	27.14	33.55	39.91	46.21
84.0	7.572	14.12	20.61	27.04	33.43	39.76	46.04
86.0	7.545	14.06	20.53	26.95	33.31	39.62	45.88
88.0	7.517	14.01	20.46	26.85	33.19	39.48	45.71
90.0	7.490	13.96	20.38	26.75	33.07	39.33	45.55
92.0	7.463	13.91	20.31	26.66	32.95	39.19	45.39
94.0	7.436	13.86	20.24	26.56	32.83	39.06	45.23
96.0	7.409	13.81	20.16	26.47	32.72	38.92	45.07
98.0	7.383	13.76	20.09	26.37	32.60	38.78	44.91
100.0	7.356	13.71	20.02	26.28	32.49	38.64	44.75
102.0	7.330	13.67	19.95	26.19	32.37	38.51	44.60
104.0	7.304	13.62	19.88	26.09	32.26	38.37	44.44
106.0	7.279	13.57	19.81	26.00	32.15	38.24	44.29
108.0	7.253	13.52	19.74	25.91	32.03	38.11	44.13
110.0	7.228	13.48	19.67	25.82	31.92	37.98	43.98
112.0	7.203	13.43	19.61	25.73	31.81	37.85	43.83
114.0	7.178	13.38	19.54	25.65	31.70	37.72	43.68
116.0	7.153	13.34	19.47	25.56	31.60	37.59	43.53
118.0	7.128	13.29	19.40	25.47	31.49	37.46	43.39
120.0	7.103	13.24	19.34	25.38	31.38	37.33	43.24
122.0	7.079	13.20	19.27	25.30	31.27	37.21	43.09
124.0	7.055	13.15	19.21	25.21	31.17	37.08	42.95
126.0	7.031	13.11	19.14	25.13	31.06	36.96	42.81
128.0	7.007	13.07	19.08	25.04	30.96	36.83	42.66
130.0	6.983	13.02	19.01	24.96	30.86	36.71	42.52

Table 11-5. Hydrogen Contents Table (SCF/cu ft) - Continued

°F	800 psig	900 psig	1000 psig	1100 psig	1200 psig	1300 psig	1400 psig
-40.0	67.36	75.27	83.10	90.86	98.54	106.2	113.7
-38.0	67.04	74.92	82.72	90.44	98.09	105.7	113.2
-36.0	66.73	74.57	82.34	90.02	97.64	105.2	112.7
-34.0	66.42	74.23	81.96	89.61	97.19	104.7	112.1
-32.0	66.12	73.89	81.58	89.20	96.75	104.2	111.6
-30.0	65.82	73.55	81.21	88.80	96.32	103.8	111.1
-28.0	65.52	73.22	80.84	88.40	95.88	103.3	110.6
-26.0	65.22	72.89	80.48	88.00	95.45	102.8	110.1
-24.0	64.93	72.56	80.12	87.61	95.03	102.4	109.7
-22.0	64.64	72.23	79.76	87.22	94.61	101.9	109.2
-20.0	64.35	71.91	79.41	86.83	94.19	101.5	108.7
-18.0	64.06	71.59	79.06	86.45	93.77	101.0	108.2
-16.0	63.78	71.28	78.71	86.07	93.36	100.6	107.7
-14.0	63.50	70.97	78.37	85.70	92.96	100.2	107.3
-12.0	63.22	70.66	78.02	85.32	92.56	99.72	106.8
-10.0	62.94	70.35	77.69	84.95	92.16	99.29	106.4
-8.0	62.67	70.04	77.35	84.59	91.76	98.87	105.9
-6.0	62.40	69.74	77.02	84.23	91.37	98.45	105.5
-4.0	62.13	69.44	76.69	83.87	90.98	98.03	105.0
-2.0	61.86	69.15	76.36	83.51	90.59	97.61	104.6
0.0	61.60	68.85	76.04	83.16	90.21	97.20	104.1
2.0	61.34	68.56	75.72	82.81	89.83	96.80	103.7
4.0	61.08	68.27	75.40	82.46	89.46	96.39	103.3
6.0	60.82	67.99	75.08	82.12	89.09	95.99	102.8
8.0	60.57	67.70	74.77	81.78	88.72	95.60	102.4
10.0	60.32	67.42	74.46	81.44	88.35	95.21	102.0
12.0	60.07	67.14	74.15	81.10	87.99	94.82	101.6
14.0	59.82	66.86	73.85	80.77	87.63	94.43	101.2
16.0	59.57	66.59	73.55	80.44	87.27	94.05	100.8
18.0	59.33	66.32	73.25	80.11	86.92	93.67	100.4
20.0	59.08	66.05	72.95	79.79	86.57	93.29	99.95
22.0	58.84	65.78	72.65	79.47	86.22	92.92	99.55
24.0	58.61	65.51	72.36	79.15	85.88	92.55	99.16
26.0	58.37	65.25	72.07	78.83	85.53	92.18	98.76
28.0	58.14	64.99	71.78	78.52	85.19	91.81	98.37
30.0	57.90	64.73	71.50	78.21	84.86	91.45	97.99
32.0	57.67	64.47	71.22	77.90	84.52	91.09	97.60
34.0	57.44	64.22	70.93	77.59	84.19	90.74	97.22
36.0	57.22	63.97	70.66	77.29	83.86	90.38	96.85
38.0	56.99	63.71	70.38	76.99	83.54	90.03	96.47
40.0	56.77	63.47	70.11	76.69	83.22	89.69	96.10
42.0	56.55	63.22	69.83	76.39	82.90	89.34	95.73
44.0	56.33	62.97	69.56	76.10	82.58	89.00	95.37
46.0	56.11	62.73	69.30	75.81	82.26	88.66	95.01

Table 11-5. Hydrogen Contents Table (SCF/cu ft) - Continued

°F	800 psig	900 psig	1000 psig	1100 psig	1200 psig	1300 psig	1400 psig
48.0	55.89	62.49	69.03	75.52	81.95	88.32	94.65
50.0	55.68	62.25	68.77	75.23	81.64	87.99	94.29
52.0	55.47	62.01	68.51	74.94	81.33	87.66	93.94
54.0	55.26	61.78	68.25	74.66	81.02	87.33	93.59
56.0	55.05	61.55	67.99	74.38	80.72	87.00	93.24
58.0	54.84	61.31	67.73	74.10	80.42	86.68	92.89
60.0	54.63	61.08	67.48	73.83	80.12	86.36	92.55
62.0	54.43	60.86	67.23	73.55	79.82	86.04	92.21
64.0	54.22	60.63	66.98	73.28	79.53	85.72	91.87
66.0	54.02	60.40	66.73	73.01	79.24	85.41	91.53
68.0	53.82	60.18	66.49	72.74	78.95	85.10	91.20
70.0	53.62	59.96	66.24	72.48	78.66	84.79	90.87
72.0	53.43	59.74	66.00	72.21	78.37	84.48	90.54
74.0	53.23	59.52	65.76	71.95	78.09	84.18	90.22
76.0	53.04	59.30	65.52	71.69	77.81	83.87	89.89
78.0	52.84	59.09	65.29	71.43	77.53	83.57	89.57
80.0	52.65	58.88	65.05	71.17	77.25	83.28	89.25
82.0	52.46	58.66	64.82	70.92	76.97	82.98	88.94
84.0	52.27	58.45	64.59	70.67	76.70	82.69	88.62
86.0	52.09	58.25	64.36	70.42	76.43	82.39	88.31
88.0	51.90	58.04	64.13	70.17	76.16	82.10	88.00
90.0	51.72	57.83	63.90	69.92	75.89	81.82	87.69
92.0	51.53	57.63	63.68	69.67	75.63	81.53	87.39
94.0	51.35	57.43	63.45	69.43	75.36	81.25	87.09
96.0	51.17	57.22	63.23	69.19	75.10	80.97	86.79
98.0	50.99	57.02	63.01	68.95	74.84	80.69	86.49
100.0	50.81	56.83	62.79	68.71	74.58	80.41	86.19
102.0	50.64	56.63	62.57	68.47	74.33	80.13	85.90
104.0	50.46	56.43	62.36	68.24	74.07	79.86	85.60
106.0	50.29	56.24	62.14	68.00	73.82	79.59	85.31
108.0	50.11	56.05	61.93	67.77	73.57	79.32	85.02
110.0	49.94	55.85	61.72	67.54	73.32	79.05	84.74
112.0	49.77	55.66	61.51	67.31	73.07	78.78	84.45
114.0	49.60	55.47	61.30	67.09	72.82	78.52	84.17
116.0	49.43	55.29	61.10	66.86	72.58	78.26	83.89
118.0	49.27	55.10	60.89	66.64	72.34	78.00	83.61
120.0	49.10	54.92	60.69	66.41	72.10	77.74	83.33
122.0	48.94	54.73	60.48	66.19	71.86	77.48	83.06
124.0	48.77	54.55	60.28	65.97	71.62	77.22	82.79
126.0	48.61	54.37	60.08	65.76	71.38	76.97	82.52
128.0	48.45	54.19	59.88	65.54	71.15	76.72	82.25
130.0	48.29	54.01	59.69	65.32	70.92	76.47	81.98

Table 11-5. Hydrogen Contents Table (SCF/cu ft) - Continued

°F	1500 psig	1600 psig	1700 psig	1800 psig	1900 psig	2000 psig	2100 psig
-40.0	121.1	128.5	135.8	143.1	150.3	157.4	164.4
-38.0	120.6	127.9	135.2	142.4	149.6	156.7	163.7
-36.0	120.0	127.4	134.6	141.8	148.9	156.0	162.9
-34.0	119.5	126.8	134.0	141.2	148.2	155.3	162.2
-32.0	119.0	126.2	133.4	140.5	147.6	154.6	161.5
-30.0	118.4	125.7	132.8	139.9	146.9	153.9	160.8
-28.0	117.9	125.1	132.2	139.3	146.3	153.2	160.1
-26.0	117.4	124.6	131.7	138.7	145.7	152.6	159.4
-24.0	116.9	124.0	131.1	138.1	145.0	151.9	158.7
-22.0	116.3	123.5	130.5	137.5	144.4	151.2	158.0
-20.0	115.8	122.9	129.9	136.9	143.8	150.6	157.3
-18.0	115.3	122.4	129.4	136.3	143.1	149.9	156.7
-16.0	114.8	121.9	128.8	135.7	142.5	149.3	156.0
-14.0	114.3	121.3	128.3	135.1	141.9	148.7	155.3
-12.0	113.9	120.8	127.7	134.6	141.3	148.0	154.7
-10.0	113.4	120.3	127.2	134.0	140.7	147.4	154.0
-8.0	112.9	119.8	126.6	133.4	140.1	146.8	153.4
-6.0	112.4	119.3	126.1	132.9	139.6	146.2	152.8
-4.0	111.9	118.8	125.6	132.3	139.0	145.6	152.1
-2.0	111.5	118.3	125.1	131.8	138.4	145.0	151.5
0.0	111.0	117.8	124.5	131.2	137.8	144.4	150.9
2.0	110.5	117.3	124.0	130.7	137.3	143.8	150.3
4.0	110.1	116.8	123.5	130.1	136.7	143.2	149.7
6.0	109.6	116.3	123.0	129.6	136.1	142.6	149.1
8.0	109.2	115.9	122.5	129.1	135.6	142.1	148.5
10.0	108.7	115.4	122.0	128.6	135.1	141.5	147.9
12.0	108.3	114.9	121.5	128.0	134.5	140.9	147.3
14.0	107.8	114.5	121.0	127.5	134.0	140.4	146.7
16.0	107.4	114.0	120.5	127.0	133.4	139.8	146.1
18.0	107.0	113.6	120.1	126.5	132.9	139.2	145.5
20.0	106.6	113.1	119.6	126.0	132.4	138.7	145.0
22.0	106.1	112.6	119.1	125.5	131.9	138.2	144.4
24.0	105.7	112.2	118.6	125.0	131.4	137.6	143.8
26.0	105.3	111.8	118.2	124.5	130.8	137.1	143.3
28.0	104.9	111.3	117.7	124.1	130.3	136.6	142.7
30.0	104.5	110.9	117.3	123.6	129.8	136.0	142.2
32.0	104.1	110.5	116.8	123.1	129.3	135.5	141.6
34.0	103.7	110.0	116.4	122.6	128.8	135.0	141.1
36.0	103.3	109.6	115.9	122.2	128.3	134.5	140.6
38.0	102.9	109.2	115.5	121.7	127.9	134.0	140.0
40.0	102.5	108.8	115.0	121.2	127.4	133.5	139.5
42.0	102.1	108.4	114.6	120.8	126.9	133.0	139.0
44.0	101.7	107.9	114.2	120.3	126.4	132.5	138.5
46.0	101.3	107.5	113.7	119.9	125.9	132.0	138.0

Table 11-5. Hydrogen Contents Table (SCF/cu ft) - Continued

°F	1500 psig	1600 psig	1700 psig	1800 psig	1900 psig	2000 psig	2100 psig
48.0	100.9	107.1	113.3	119.4	125.5	131.5	137.4
50.0	100.5	106.7	112.9	119.0	125.0	131.0	136.9
52.0	100.2	106.3	112.5	118.5	124.5	130.5	136.4
54.0	99.79	105.9	112.0	118.1	124.1	130.0	135.9
56.0	99.42	105.5	111.6	117.7	123.6	129.6	135.4
58.0	99.05	105.2	111.2	117.2	123.2	129.1	134.9
60.0	98.68	104.8	110.8	116.8	122.7	128.6	134.5
62.0	98.32	104.4	110.4	116.4	122.3	128.2	134.0
64.0	97.96	104.0	110.0	115.9	121.8	127.7	133.5
66.0	97.61	103.6	109.6	115.5	121.4	127.2	133.0
68.0	97.25	103.3	109.2	115.1	121.0	126.8	132.5
70.0	96.90	102.9	108.8	114.7	120.5	126.3	132.1
72.0	96.55	102.5	108.4	114.3	120.1	125.9	131.6
74.0	96.21	102.1	108.0	113.9	119.7	125.4	131.1
76.0	95.86	101.8	107.7	113.5	119.3	125.0	130.7
78.0	95.52	101.4	107.3	113.1	118.8	124.6	130.2
80.0	95.18	101.1	106.9	112.7	118.4	124.1	129.8
82.0	94.85	100.7	106.5	112.3	118.0	123.7	129.3
84.0	94.51	100.4	106.2	111.9	117.6	123.3	128.9
86.0	94.18	100.0	105.8	111.5	117.2	122.8	128.4
88.0	93.85	99.66	105.4	111.1	116.8	122.4	128.0
90.0	93.53	99.31	105.0	110.7	116.4	122.0	127.6
92.0	93.20	98.97	104.7	110.4	116.0	121.6	127.1
94.0	92.88	98.63	104.3	110.0	115.6	121.2	126.7
96.0	92.56	98.29	104.0	109.6	115.2	120.8	126.3
98.0	92.24	97.95	103.6	109.2	114.8	120.3	125.8
100.0	91.93	97.62	103.3	108.9	114.4	119.9	125.4
102.0	91.61	97.29	102.9	108.5	114.0	119.5	125.0
104.0	91.30	96.96	102.6	108.1	113.7	119.1	124.6
106.0	90.99	96.63	102.2	107.8	113.3	118.7	124.2
108.0	90.69	96.30	101.9	107.4	112.9	118.4	123.8
110.0	90.38	95.98	101.5	107.1	112.5	118.0	123.4
112.0	90.08	95.66	101.2	106.7	112.2	117.6	122.9
114.0	89.78	95.34	100.9	106.3	111.8	117.2	122.5
116.0	89.48	95.03	100.5	106.0	111.4	116.8	122.1
118.0	89.18	94.71	100.2	105.7	111.1	116.4	121.7
120.0	88.89	94.40	99.87	105.3	110.7	116.0	121.4
122.0	88.60	94.09	99.55	105.0	110.3	115.7	121.0
124.0	88.31	93.79	99.22	104.6	110.0	115.3	120.6
126.0	88.02	93.48	98.90	104.3	109.6	114.9	120.2
128.0	87.73	93.18	98.58	103.9	109.3	114.6	119.8
130.0	87.45	92.88	98.26	103.6	108.9	114.2	119.4

Table 11-5. Hydrogen Contents Table (SCF/cu ft) - Continued

°F	2200 psig	2300 psig	2400 psig	2500 psig	2600 psig	2700 psig	2800 psig
-40.0	171.3	178.2	185.1	191.8	198.5	205.1	211.7
-38.0	170.6	177.4	184.2	191.0	197.6	204.2	210.7
-36.0	169.8	176.7	183.4	190.1	196.8	203.3	209.8
-34.0	169.1	175.9	182.6	189.3	195.9	202.4	208.9
-32.0	168.3	175.1	181.8	188.5	195.1	201.6	208.0
-30.0	167.6	174.4	181.0	187.7	194.2	200.7	207.1
-28.0	166.9	173.6	180.3	186.9	193.4	199.9	206.3
-26.0	166.1	172.8	179.5	186.1	192.6	199.0	205.4
-24.0	165.4	172.1	178.7	185.3	191.7	198.2	204.5
-22.0	164.7	171.4	178.0	184.5	190.9	197.3	203.7
-20.0	164.0	170.6	177.2	183.7	190.1	196.5	202.8
-18.0	163.3	169.9	176.5	182.9	189.3	195.7	202.0
-16.0	162.6	169.2	175.7	182.2	188.5	194.9	201.1
-14.0	161.9	168.5	175.0	181.4	187.8	194.1	200.3
-12.0	161.3	167.8	174.3	180.7	187.0	193.3	199.5
-10.0	160.6	167.1	173.5	179.9	186.2	192.5	198.7
-8.0	159.9	166.4	172.8	179.2	185.5	191.7	197.9
-6.0	159.3	165.7	172.1	178.4	184.7	190.9	197.1
-4.0	158.6	165.0	171.4	177.7	184.0	190.1	196.3
-2.0	158.0	164.4	170.7	177.0	183.2	189.4	195.5
0.0	157.3	163.7	170.0	176.3	182.5	188.6	194.7
2.0	156.7	163.0	169.3	175.6	181.7	187.9	193.9
4.0	156.0	162.4	168.7	174.9	181.0	187.1	193.2
6.0	155.4	161.7	168.0	174.2	180.3	186.4	192.4
8.0	154.8	161.1	167.3	173.5	179.6	185.7	191.7
10.0	154.2	160.4	166.6	172.8	178.9	184.9	190.9
12.0	153.6	159.8	166.0	172.1	178.2	184.2	190.2
14.0	153.0	159.2	165.3	171.4	177.5	183.5	189.4
16.0	152.4	158.6	164.7	170.8	176.8	182.8	188.7
18.0	151.8	157.9	164.0	170.1	176.1	182.1	188.0
20.0	151.2	157.3	163.4	169.5	175.4	181.4	187.3
22.0	150.6	156.7	162.8	168.8	174.8	180.7	186.6
24.0	150.0	156.1	162.2	168.2	174.1	180.0	185.8
26.0	149.4	155.5	161.5	167.5	173.4	179.3	185.1
28.0	148.8	154.9	160.9	166.9	172.8	178.6	184.4
30.0	148.3	154.3	160.3	166.2	172.1	178.0	183.8
32.0	147.7	153.7	159.7	165.6	171.5	177.3	183.1
34.0	147.2	153.2	159.1	165.0	170.8	176.6	182.4
36.0	146.6	152.6	158.5	164.4	170.2	176.0	181.7
38.0	146.0	152.0	157.9	163.8	169.6	175.3	181.0
40.0	145.5	151.4	157.3	163.2	169.0	174.7	180.4
42.0	145.0	150.9	156.7	162.6	168.3	174.1	179.7
44.0	144.4	150.3	156.2	162.0	167.7	173.4	179.1
46.0	143.9	149.8	155.6	161.4	167.1	172.8	178.4

Table 11-5. Hydrogen Contents Table (SCF/cu ft) - Continued

°F	2200 psig	2300 psig	2400 psig	2500 psig	2600 psig	2700 psig	2800 psig
48.0	143.3	149.2	155.0	160.8	166.5	172.2	177.8
50.0	142.8	148.7	154.5	160.2	165.9	171.5	177.1
52.0	142.3	148.1	153.9	159.6	165.3	170.9	176.5
54.0	141.8	147.6	153.3	159.0	164.7	170.3	175.9
56.0	141.3	147.0	152.8	158.5	164.1	169.7	175.3
58.0	140.8	146.5	152.2	157.9	163.5	169.1	174.6
60.0	140.3	146.0	151.7	157.3	162.9	168.5	174.0
62.0	139.7	145.5	151.2	156.8	162.4	167.9	173.4
64.0	139.2	145.0	150.6	156.2	161.8	167.3	172.8
66.0	138.8	144.4	150.1	155.7	161.2	166.7	172.2
68.0	138.3	143.9	149.6	155.1	160.7	166.2	171.6
70.0	137.8	143.4	149.0	154.6	160.1	165.6	171.0
72.0	137.3	142.9	148.5	154.0	159.5	165.0	170.4
74.0	136.8	142.4	148.0	153.5	159.0	164.4	169.8
76.0	136.3	141.9	147.5	153.0	158.4	163.9	169.2
78.0	135.9	141.4	147.0	152.5	157.9	163.3	168.7
80.0	135.4	140.9	146.5	151.9	157.4	162.7	168.1
82.0	134.9	140.5	146.0	151.4	156.8	162.2	167.5
84.0	134.4	140.0	145.5	150.9	156.3	161.6	167.0
86.0	134.0	139.5	145.0	150.4	155.8	161.1	166.4
88.0	133.5	139.0	144.5	149.9	155.2	160.6	165.8
90.0	133.1	138.6	144.0	149.4	154.7	160.0	165.3
92.0	132.6	138.1	143.5	148.9	154.2	159.5	164.7
94.0	132.2	137.6	143.0	148.4	153.7	159.0	164.2
96.0	131.7	137.2	142.5	147.9	153.2	158.4	163.6
98.0	131.3	136.7	142.1	147.4	152.7	157.9	163.1
100.0	130.9	136.2	141.6	146.9	152.2	157.4	162.6
102.0	130.4	135.8	141.1	146.4	151.7	156.9	162.0
104.0	130.0	135.3	140.7	145.9	151.2	156.4	161.5
106.0	129.6	134.9	140.2	145.5	150.7	155.9	161.0
108.0	129.1	134.4	139.7	145.0	150.2	155.3	160.5
110.0	128.7	134.0	139.3	144.5	149.7	154.8	160.0
112.0	128.3	133.6	138.8	144.0	149.2	154.3	159.4
114.0	127.9	133.1	138.4	143.6	148.7	153.9	158.9
116.0	127.4	132.7	137.9	143.1	148.3	153.4	158.4
118.0	127.0	132.3	137.5	142.6	147.8	152.9	157.9
120.0	126.6	131.9	137.0	142.2	147.3	152.4	157.4
122.0	126.2	131.4	136.6	141.7	146.8	151.9	156.9
124.0	125.8	131.0	136.2	141.3	146.4	151.4	156.4
126.0	125.4	130.6	135.7	140.8	145.9	150.9	155.9
128.0	125.0	130.2	135.3	140.4	145.5	150.5	155.5
130.0	124.6	129.8	134.9	140.0	145.0	150.0	155.0

Table 11-5. Hydrogen Contents Table (SCF/cu ft) - Continued

°F	2900 psig	3000 psig	3100 psig	3200 psig	3300 psig	3400 psig	3500 psig
-40.0	218.1	224.6	230.9	237.2	243.4	249.6	255.7
-38.0	217.2	223.6	229.9	236.2	242.4	248.5	254.6
-36.0	216.3	222.6	228.9	235.2	241.4	247.5	253.6
-34.0	215.3	221.7	228.0	234.2	240.4	246.5	252.5
-32.0	214.4	220.7	227.0	233.2	239.3	245.4	251.4
-30.0	213.5	219.8	226.0	232.2	238.3	244.4	250.4
-28.0	212.6	218.9	225.1	231.3	237.4	243.4	249.4
-26.0	211.7	218.0	224.2	230.3	236.4	242.4	248.3
-24.0	210.8	217.1	223.2	229.3	235.4	241.4	247.3
-22.0	209.9	216.1	222.3	228.4	234.4	240.4	246.3
-20.0	209.1	215.3	221.4	227.5	233.5	239.4	245.3
-18.0	208.2	214.4	220.5	226.5	232.5	238.5	244.3
-16.0	207.3	213.5	219.6	225.6	231.6	237.5	243.4
-14.0	206.5	212.6	218.7	224.7	230.7	236.5	242.4
-12.0	205.7	211.8	217.8	223.8	229.7	235.6	241.4
-10.0	204.8	210.9	216.9	222.9	228.8	234.7	240.5
-8.0	204.0	210.1	216.1	222.0	227.9	233.7	239.5
-6.0	203.2	209.2	215.2	221.1	227.0	232.8	238.6
-4.0	202.4	208.4	214.3	220.2	226.1	231.9	237.6
-2.0	201.5	207.5	213.5	219.4	225.2	231.0	236.7
0.0	200.7	206.7	212.6	218.5	224.3	230.1	235.8
2.0	200.0	205.9	211.8	217.7	223.5	229.2	234.9
4.0	199.2	205.1	211.0	216.8	222.6	228.3	234.0
6.0	198.4	204.3	210.2	216.0	221.7	227.4	233.1
8.0	197.6	203.5	209.4	215.1	220.9	226.6	232.2
10.0	196.8	202.7	208.5	214.3	220.0	225.7	231.3
12.0	196.1	201.9	207.7	213.5	219.2	224.9	230.5
14.0	195.3	201.2	207.0	212.7	218.4	224.0	229.6
16.0	194.6	200.4	206.2	211.9	217.5	223.2	228.7
18.0	193.8	199.6	205.4	211.1	216.7	222.3	227.9
20.0	193.1	198.9	204.6	210.3	215.9	221.5	227.0
22.0	192.4	198.1	203.8	209.5	215.1	220.7	226.2
24.0	191.6	197.4	203.1	208.7	214.3	219.9	225.3
26.0	190.9	196.6	202.3	207.9	213.5	219.0	224.5
28.0	190.2	195.9	201.6	207.2	212.7	218.2	223.7
30.0	189.5	195.2	200.8	206.4	211.9	217.4	222.9
32.0	188.8	194.5	200.1	205.6	211.2	216.6	222.1
34.0	188.1	193.7	199.3	204.9	210.4	215.9	221.3
36.0	187.4	193.0	198.6	204.1	209.6	215.1	220.5
38.0	186.7	192.3	197.9	203.4	208.9	214.3	219.7
40.0	186.0	191.6	197.2	202.7	208.1	213.5	218.9
42.0	185.4	190.9	196.5	201.9	207.4	212.8	218.1
44.0	184.7	190.2	195.8	201.2	206.6	212.0	217.3
46.0	184.0	189.6	195.1	200.5	205.9	211.3	216.6

Table 11-5. Hydrogen Contents Table (SCF/cu ft) - Continued

°F	2900 psig	3000 psig	3100 psig	3200 psig	3300 psig	3400 psig	3500 psig
48.0	183.4	188.9	194.4	199.8	205.2	210.5	215.8
50.0	182.7	188.2	193.7	199.1	204.5	209.8	215.1
52.0	182.0	187.5	193.0	198.4	203.7	209.0	214.3
54.0	181.4	186.9	192.3	197.7	203.0	208.3	213.6
56.0	180.8	186.2	191.6	197.0	202.3	207.6	212.8
58.0	180.1	185.6	190.9	196.3	201.6	206.9	212.1
60.0	179.5	184.9	190.3	195.6	200.9	206.2	211.4
62.0	178.9	184.3	189.6	194.9	200.2	205.4	210.6
64.0	178.2	183.6	189.0	194.3	199.5	204.7	209.9
66.0	177.6	183.0	188.3	193.6	198.8	204.0	209.2
68.0	177.0	182.3	187.7	192.9	198.2	203.3	208.5
70.0	176.4	181.7	187.0	192.3	197.5	202.7	207.8
72.0	175.8	181.1	186.4	191.6	196.8	202.0	207.1
74.0	175.2	180.5	185.7	191.0	196.2	201.3	206.4
76.0	174.6	179.9	185.1	190.3	195.5	200.6	205.7
78.0	174.0	179.3	184.5	189.7	194.8	200.0	205.0
80.0	173.4	178.7	183.9	189.1	194.2	199.3	204.3
82.0	172.8	178.1	188.3	188.4	193.5	198.6	203.7
84.0	172.2	177.5	182.6	187.8	192.9	198.0	203.0
86.0	171.7	176.9	182.0	187.2	192.3	197.3	202.3
88.0	171.1	176.3	181.4	186.6	191.6	196.7	201.7
90.0	170.5	175.7	180.8	185.9	191.0	196.0	201.0
92.0	169.9	175.1	180.2	185.3	190.4	195.4	200.4
94.0	169.4	174.5	179.6	184.7	189.8	194.8	199.7
96.0	168.8	174.0	179.1	184.1	189.1	194.1	199.1
98.0	168.3	173.4	178.5	183.5	188.5	193.5	198.4
100.0	167.7	172.8	177.9	182.9	187.9	192.9	197.8
102.0	167.2	172.3	177.3	182.3	187.3	192.3	197.2
104.0	166.6	171.7	176.8	181.8	186.7	191.6	196.5
106.0	166.1	171.2	176.2	181.2	186.1	191.0	195.9
108.0	165.6	170.6	175.6	180.6	185.5	190.4	195.3
110.0	165.0	170.1	175.1	180.0	184.9	189.8	194.7
112.0	164.5	169.5	174.5	179.4	184.4	189.2	194.1
114.0	164.0	169.0	174.0	178.9	183.8	188.6	193.5
116.0	163.5	168.4	173.4	178.3	183.2	188.0	192.9
118.0	162.9	167.9	172.9	177.8	182.6	187.5	192.3
120.0	162.4	167.4	172.3	177.2	182.1	186.9	191.7
122.0	161.9	166.9	171.8	176.7	181.5	186.3	191.1
124.0	161.4	166.3	171.2	176.1	180.9	185.7	190.5
126.0	160.9	165.8	170.7	175.6	180.4	185.2	189.9
128.0	160.4	165.3	170.2	175.0	179.8	184.6	189.3
130.0	159.9	164.8	169.7	174.5	179.3	184.0	188.7

Table 11-5. Hydrogen Contents Table (SCF/cu ft) - Continued

°F	3600 psig	3700 psig	3800 psig	3900 psig	4000 psig	4100 psig	4200 psig
-40.0	261.7	267.7	273.7	279.5	285.3	291.1	296.8
-38.0	260.6	266.6	272.5	278.4	284.1	289.9	295.6
-36.0	259.6	265.5	271.4	277.2	283.0	288.7	294.4
-34.0	258.5	264.4	270.3	276.1	281.8	287.5	293.2
-32.0	257.4	263.3	269.2	274.9	280.7	286.4	292.0
-30.0	256.3	262.2	268.1	273.8	279.5	285.2	290.8
-28.0	255.3	261.2	267.0	272.7	278.4	284.1	289.6
-26.0	254.3	260.1	265.9	271.6	277.3	282.9	288.5
-24.0	253.2	259.0	264.8	270.5	276.2	281.8	287.4
-22.0	252.2	258.0	263.8	269.4	275.1	280.7	286.2
-20.0	251.2	257.0	262.7	268.4	274.0	279.6	285.1
-18.0	250.2	255.9	261.7	267.3	272.9	278.5	284.0
-16.0	249.2	254.9	260.6	266.3	271.8	277.4	282.9
-14.0	248.2	253.9	259.6	265.2	270.8	276.3	281.8
-12.0	247.2	252.9	258.6	264.2	269.7	275.2	280.7
-10.0	246.2	251.9	257.6	263.1	268.7	274.2	279.6
-8.0	245.3	250.9	256.6	262.1	267.6	273.1	278.5
-6.0	244.3	250.0	255.6	261.1	266.6	272.1	277.5
-4.0	243.3	249.0	254.6	260.1	265.6	271.0	276.4
-2.0	242.4	248.0	253.6	259.1	264.6	270.0	275.4
0.0	241.5	247.1	252.6	258.1	263.6	269.0	274.3
2.0	240.5	246.1	251.7	257.1	262.6	268.0	273.3
4.0	239.6	245.2	250.7	256.2	261.6	267.0	272.3
6.0	238.7	244.3	249.8	255.2	260.6	266.0	271.3
8.0	237.8	243.3	248.8	254.3	259.6	265.0	270.3
10.0	236.9	242.4	247.9	253.3	258.7	264.0	269.3
12.0	236.0	241.5	247.0	252.4	257.7	263.0	268.3
14.0	235.1	240.6	246.0	251.4	256.8	262.1	267.3
16.0	234.2	239.7	245.1	250.5	255.8	261.1	266.3
18.0	233.4	238.8	244.2	249.6	254.9	260.2	265.4
20.0	232.5	237.9	243.3	248.7	254.0	259.2	264.4
22.0	231.6	237.1	242.4	247.8	253.0	258.3	263.5
24.0	230.8	236.2	241.6	246.9	252.1	257.3	262.5
26.0	230.0	235.3	240.7	246.0	251.2	256.4	261.6
28.0	229.1	234.5	239.8	245.1	250.3	255.5	260.6
30.0	228.3	233.6	238.9	244.2	249.4	254.6	259.7
32.0	227.5	232.8	238.1	243.3	248.5	253.7	258.8
34.0	226.6	232.0	237.2	242.5	247.7	252.8	257.9
36.0	225.8	231.1	236.4	241.6	246.8	251.9	257.0
38.0	225.0	230.3	235.6	240.8	245.9	251.0	256.1
40.0	224.2	229.5	234.7	239.9	245.0	250.1	255.2
42.0	223.4	228.7	233.9	239.1	244.2	249.3	254.3
44.0	222.6	227.9	233.1	238.2	243.3	248.4	253.4
46.0	221.8	227.1	232.3	237.4	242.5	247.6	252.6

Table 11-5. Hydrogen Contents Table (SCF/cu ft) - Continued

°F	3600 psig	3700 psig	3800 psig	3900 psig	4000 psig	4100 psig	4200 psig
48.0	221.1	226.3	231.5	236.6	241.7	246.7	251.7
50.0	220.3	225.5	230.6	235.8	240.8	245.9	250.8
52.0	219.5	224.7	229.9	234.9	240.0	245.0	250.0
54.0	218.8	223.9	229.1	234.1	239.2	244.2	249.1
56.0	218.0	223.2	228.3	233.3	238.4	243.4	248.3
58.0	217.3	222.4	227.5	232.6	237.6	242.5	247.5
60.0	216.5	221.6	226.7	231.8	236.8	241.7	246.6
62.0	215.8	220.9	226.0	231.0	236.0	240.9	245.8
64.0	215.0	220.1	225.2	230.2	235.2	240.1	245.0
66.0	214.3	219.4	224.4	229.4	234.4	239.3	244.2
68.0	213.6	218.7	223.7	228.7	233.6	238.5	243.4
70.0	212.9	217.9	222.9	227.9	232.8	237.7	242.6
72.0	212.2	217.2	222.2	227.1	232.1	236.9	241.8
74.0	211.5	216.5	221.5	226.4	231.3	236.2	241.0
76.0	210.8	215.8	220.7	225.7	230.5	235.4	240.2
78.0	210.1	215.0	220.0	224.9	229.8	234.6	239.4
80.0	209.4	214.3	219.3	224.2	229.0	233.9	238.7
82.0	208.7	213.6	218.6	223.4	228.3	233.1	237.9
84.0	208.0	212.9	217.8	222.7	227.6	232.4	237.1
86.0	207.3	212.2	217.1	222.0	226.8	231.6	236.4
88.0	206.6	211.6	216.4	221.3	226.1	230.9	235.6
90.0	206.0	210.9	215.7	220.6	225.4	230.1	234.9
92.0	205.3	210.2	215.0	219.9	224.7	229.4	234.1
94.0	204.6	209.5	214.4	219.2	223.9	228.7	233.4
96.0	204.0	208.8	213.7	218.5	223.2	228.0	232.6
98.0	203.3	208.2	213.0	217.8	222.5	227.2	231.9
100.0	202.7	207.5	212.3	217.1	221.8	226.5	231.2
102.0	202.0	206.9	211.7	216.4	221.1	225.8	230.5
104.0	201.4	206.2	211.0	215.7	220.4	225.1	229.8
106.0	200.8	205.6	210.3	215.1	219.8	224.4	229.0
108.0	200.1	204.9	209.7	214.4	219.1	223.7	228.3
110.0	199.5	204.3	209.0	213.7	218.4	223.0	227.6
112.0	198.9	203.6	208.4	213.1	217.7	222.3	226.9
114.0	198.2	203.0	207.7	212.4	217.0	221.7	226.2
116.0	197.6	202.4	207.1	211.7	216.4	221.0	225.6
118.0	197.0	201.7	206.4	211.1	215.7	220.3	224.9
120.0	196.4	201.1	205.8	210.5	215.1	219.6	224.2
122.0	195.8	200.5	205.2	209.8	214.4	219.0	223.5
124.0	195.2	199.9	204.6	209.2	213.8	218.3	222.8
126.0	194.6	199.3	203.9	208.5	213.1	217.7	222.2
128.0	194.0	198.7	203.3	207.9	212.5	217.0	221.5
130.0	193.4	198.1	202.7	207.3	211.8	216.4	220.9

Table 11-5. Hydrogen Contents Table (SCF/cu ft) - Continued

°F	4300 psig	4400 psig	4500 psig	4600 psig	4700 psig	4800 psig	4900 psig
-40.0	302.4	308.0	313.5	319.0	324.4	329.8	335.1
-38.0	301.2	306.7	312.2	317.7	323.1	328.5	333.8
-36.0	300.0	305.5	311.0	316.4	321.8	327.2	332.4
-34.0	298.7	304.3	309.8	315.2	320.5	325.9	331.1
-32.0	297.5	303.1	308.5	313.9	319.3	324.6	329.8
-30.0	296.4	301.9	307.3	312.7	318.0	323.3	328.6
-28.0	295.2	300.7	306.1	311.5	316.8	322.1	327.3
-26.0	294.0	299.5	304.9	310.3	315.6	320.8	326.0
-24.0	292.9	298.3	303.7	309.0	314.3	319.6	324.8
-22.0	291.7	297.1	302.5	307.8	313.1	318.4	323.5
-20.0	290.6	296.0	301.3	306.7	311.9	317.1	322.3
-18.0	289.4	294.8	300.2	305.5	310.7	315.9	321.1
-16.0	288.3	293.7	299.0	304.3	309.6	314.7	319.9
-14.0	287.2	292.6	297.9	303.2	308.4	313.6	318.7
-12.0	286.1	291.4	296.8	302.0	307.2	312.4	317.5
-10.0	285.0	290.3	295.6	300.9	306.1	311.2	316.3
-8.0	283.9	289.2	294.5	299.7	304.9	310.0	315.1
-6.0	282.8	288.1	293.4	298.6	303.8	308.9	314.0
-4.0	281.8	287.1	292.3	297.5	302.6	307.8	312.8
-2.0	280.7	286.0	291.2	296.4	301.5	306.6	311.7
0.0	279.7	284.9	290.1	295.3	300.4	305.5	310.5
2.0	278.6	283.9	289.1	294.2	299.3	304.4	309.4
4.0	277.6	282.8	288.0	293.1	298.2	303.3	308.3
6.0	276.5	281.8	286.9	292.1	297.1	302.2	307.2
8.0	275.5	280.7	285.9	291.0	296.1	301.1	306.1
10.0	274.5	279.7	284.8	289.9	295.0	300.0	305.0
12.0	273.5	278.7	283.8	288.9	293.9	298.9	303.9
14.0	272.5	277.7	282.8	287.9	292.9	297.9	302.8
16.0	271.5	276.7	281.8	286.8	291.8	296.8	301.7
18.0	270.5	275.7	280.8	285.8	290.8	295.7	300.7
20.0	269.6	274.7	279.8	284.8	289.8	294.7	299.6
22.0	268.6	273.7	278.8	283.8	288.7	293.7	298.6
24.0	267.6	272.7	277.8	282.8	287.7	292.6	297.5
26.0	266.7	271.8	276.8	281.8	286.7	291.6	296.5
28.0	265.7	270.8	275.8	280.8	285.7	290.6	295.5
30.0	264.8	269.9	274.9	279.8	284.7	289.6	294.4
32.0	263.9	268.9	273.9	278.8	283.7	288.6	293.4
34.0	263.0	268.0	272.9	277.9	282.8	287.6	292.4
36.0	262.0	267.0	272.0	276.9	281.8	286.6	291.4
38.0	261.1	266.1	271.1	276.0	280.8	285.7	290.4
40.0	260.2	265.2	270.1	275.0	279.9	284.7	289.5
42.0	259.3	264.3	269.2	274.1	278.9	283.7	288.5
44.0	258.4	263.4	268.3	273.1	278.0	282.8	287.5
46.0	257.5	262.5	267.4	272.2	277.0	281.8	286.5

Table 11-5. Hydrogen Contents Table (SCF/cu ft) - Continued

°F	4300 psig	4400 psig	4500 psig	4600 psig	4700 psig	4800 psig	4900 psig
48.0	256.7	261.6	266.5	271.3	276.1	280.9	285.6
50.0	255.8	260.7	265.6	270.4	275.2	279.9	284.6
52.0	254.9	259.8	264.7	269.5	274.3	279.0	283.7
54.0	254.1	258.9	263.8	268.6	273.4	278.1	282.8
56.0	253.2	258.1	262.9	267.7	272.4	277.2	281.8
58.0	252.4	257.2	262.0	266.8	271.5	276.2	280.9
60.0	251.5	256.4	261.2	265.9	270.7	275.3	280.0
62.0	250.7	255.5	260.3	265.1	269.8	274.4	279.1
64.0	249.9	254.7	259.4	264.2	268.9	273.6	278.2
66.0	249.0	253.8	258.6	263.3	268.0	272.7	277.3
68.0	248.2	253.0	257.7	262.5	267.1	271.8	276.4
70.0	247.4	252.2	256.9	261.6	266.3	270.9	275.5
72.0	246.6	251.3	256.1	260.8	265.4	270.0	274.6
74.0	245.8	250.5	255.2	259.9	264.6	269.2	273.8
76.0	245.0	249.7	254.4	259.1	263.7	268.3	272.9
78.0	244.2	248.9	253.6	258.3	262.9	267.5	272.0
80.0	243.4	248.1	252.8	257.4	262.1	266.6	271.2
82.0	242.6	247.3	252.0	256.6	261.2	265.8	270.3
84.0	241.8	246.5	251.2	255.8	260.4	264.9	269.5
86.0	241.1	245.8	250.4	255.0	259.6	264.1	268.6
88.0	240.3	245.0	249.6	254.2	258.8	263.3	267.8
90.0	239.5	244.2	248.8	253.4	258.0	262.5	267.0
92.0	238.8	243.4	248.0	252.6	257.2	261.7	266.1
94.0	238.0	242.7	247.3	251.8	256.4	260.9	265.3
96.0	237.3	241.9	246.5	251.0	255.6	260.0	264.5
98.0	236.6	241.2	245.7	250.3	254.8	259.3	263.7
100.0	235.8	240.4	245.0	249.5	254.0	258.5	262.9
102.0	235.1	239.7	244.2	248.7	253.2	257.7	262.1
104.0	234.4	238.9	243.5	248.0	252.4	256.9	261.3
106.0	233.6	238.2	242.7	247.2	251.7	256.1	260.5
108.0	232.9	237.5	242.0	246.5	250.9	255.3	259.7
110.0	232.2	236.7	241.2	245.7	250.2	254.6	258.9
112.0	231.5	236.0	240.5	245.0	249.4	253.8	258.2
114.0	230.8	235.3	239.8	244.2	248.7	253.0	257.4
116.0	230.1	234.6	239.1	243.5	247.9	252.3	256.6
118.0	229.4	233.9	238.4	242.8	247.2	251.5	255.9
120.0	228.7	233.2	237.6	242.1	246.4	250.8	255.1
122.0	228.0	232.5	236.9	241.3	245.7	250.1	254.4
124.0	227.3	231.8	236.2	240.6	245.0	249.3	253.6
126.0	226.7	231.1	235.5	239.9	244.3	248.6	252.9
128.0	226.0	230.4	234.8	239.2	243.5	247.9	252.1
130.0	225.3	229.7	234.1	238.5	242.8	247.1	251.4

Table 11-5. Hydrogen Contents Table (SCF/cu ft) - Continued

°F	5000 psig	5100 psig	5200 psig	5300 psig	5400 psig	5500 psig	5600 psig
-40.0	340.3	345.6	350.7	355.8	360.9	365.9	370.9
-38.0	339.0	344.2	349.4	354.5	359.5	364.5	369.5
-36.0	337.7	342.9	348.0	353.1	358.1	363.1	368.1
-34.0	336.4	341.5	346.7	351.7	356.8	361.7	366.7
-32.0	335.1	340.2	345.3	350.4	355.4	360.4	365.3
-30.0	333.8	338.9	344.0	349.0	354.0	359.0	363.9
-28.0	332.5	337.6	342.7	347.7	352.7	357.7	362.6
-26.0	331.2	336.3	341.4	346.4	351.4	356.3	361.2
-24.0	329.9	335.0	340.1	345.1	350.1	355.0	359.9
-22.0	328.7	333.8	338.8	343.8	348.8	353.7	358.5
-20.0	327.4	332.5	337.5	342.5	347.5	352.4	357.2
-18.0	326.2	331.3	336.3	341.3	346.2	351.1	355.9
-16.0	325.0	330.0	335.0	340.0	344.9	349.8	354.6
-14.0	323.8	328.8	333.8	338.7	343.6	348.5	353.3
-12.0	322.6	327.6	332.6	337.5	342.4	347.2	352.0
-10.0	321.4	326.4	331.3	336.3	341.1	346.0	350.8
-8.0	320.2	325.2	330.1	335.0	339.9	344.7	349.5
-6.0	319.0	324.0	328.9	333.8	338.7	343.5	348.2
-4.0	317.8	322.8	327.7	332.6	337.4	342.2	347.0
-2.0	316.7	321.6	326.5	331.4	336.2	341.0	345.8
0.0	315.5	320.5	325.4	330.2	335.0	339.8	344.5
2.0	314.4	319.3	324.2	329.0	333.8	338.6	343.3
4.0	313.2	318.2	323.0	327.9	332.7	337.4	342.1
6.0	312.1	317.0	321.9	326.7	331.5	336.2	340.9
8.0	311.0	315.9	320.7	325.5	330.3	335.0	339.7
10.0	309.9	314.8	319.6	324.4	329.2	333.9	338.5
12.0	308.8	313.7	318.5	323.3	328.0	332.7	337.4
14.0	307.7	312.5	317.4	322.1	326.9	331.6	336.2
16.0	306.6	311.4	316.3	321.0	325.7	330.4	335.1
18.0	305.5	310.4	315.1	319.9	324.6	329.3	333.9
20.0	304.5	309.3	314.1	318.8	323.5	328.1	332.8
22.0	303.4	308.2	313.0	317.7	322.4	327.0	331.6
24.0	302.3	307.1	311.9	316.6	321.3	325.9	330.5
26.0	301.3	306.1	310.8	315.5	320.2	324.8	329.4
28.0	300.3	305.0	309.8	314.5	319.1	323.7	328.3
30.0	299.2	304.0	308.7	313.4	318.0	322.6	327.2
32.0	298.2	303.0	307.7	312.3	317.0	321.5	326.1
34.0	297.2	301.9	306.6	311.3	315.9	320.5	325.0
36.0	296.2	300.9	305.6	310.2	314.8	319.4	323.9
38.0	295.2	299.9	304.6	309.2	313.8	318.3	322.9
40.0	294.2	298.9	303.5	308.2	312.7	317.3	321.8
42.0	293.2	297.9	302.5	307.1	311.7	316.3	320.8
44.0	292.2	296.9	301.5	306.1	310.7	315.2	319.7
46.0	291.2	295.9	300.5	305.1	309.7	314.2	318.7

Table 11-5. Hydrogen Contents Table (SCF/cu ft) - Continued

°F	5000 psig	5100 psig	5200 psig	5300 psig	5400 psig	5500 psig	5600 psig
48.0	290.3	294.9	299.5	304.1	308.7	313.2	317.6
50.0	289.3	294.0	298.6	303.1	307.7	312.1	316.6
52.0	288.4	293.0	297.6	302.1	306.7	311.1	315.6
54.0	287.4	292.0	296.6	301.2	305.7	310.1	314.6
56.0	286.5	291.1	295.6	300.2	304.7	309.1	313.6
58.0	285.5	290.1	294.7	299.2	303.7	308.1	312.6
60.0	284.6	289.2	293.7	298.2	302.7	307.2	311.6
62.0	283.7	288.3	292.8	297.3	301.8	306.2	310.6
64.0	282.8	287.3	291.9	296.3	300.8	305.2	309.6
66.0	281.9	286.4	290.9	295.4	299.8	304.3	308.6
68.0	281.0	285.5	290.0	294.5	298.9	303.3	307.7
70.0	280.1	284.6	289.1	293.5	298.0	302.3	306.7
72.0	279.2	283.7	288.2	292.6	297.0	301.4	305.7
74.0	278.3	282.8	287.3	291.7	296.1	300.5	304.8
76.0	277.4	281.9	286.4	290.8	295.2	299.5	303.9
78.0	276.5	281.0	285.5	289.9	294.3	298.6	302.9
80.0	275.7	280.1	284.6	289.0	293.3	297.7	302.0
82.0	274.8	279.3	283.7	288.1	292.4	296.8	301.1
84.0	273.9	278.4	282.8	287.2	291.5	295.9	300.1
86.0	273.1	277.5	281.9	286.3	290.6	295.0	299.2
88.0	272.2	276.7	281.1	285.4	289.8	294.1	298.3
90.0	271.4	275.8	280.2	284.6	288.9	293.2	297.4
92.0	270.6	275.0	279.4	283.7	288.0	292.3	296.5
94.0	269.7	274.1	278.5	282.8	287.1	291.4	295.6
96.0	268.9	273.3	277.7	282.0	286.3	290.5	294.8
98.0	268.1	272.5	276.8	281.1	285.4	289.7	293.9
100.0	267.3	271.6	276.0	280.3	284.6	288.8	293.0
102.0	266.5	270.8	275.2	279.4	283.7	287.9	292.1
104.0	265.7	270.0	274.3	278.6	282.9	287.1	291.3
106.0	264.9	269.2	273.5	277.8	282.0	286.2	290.4
108.0	264.1	268.4	272.7	277.0	281.2	285.4	289.6
110.0	263.3	267.6	271.9	276.1	280.4	284.5	288.7
112.0	262.5	266.8	271.1	275.3	279.5	283.7	287.9
114.0	261.7	266.0	270.3	274.5	278.7	282.9	287.0
116.0	260.9	265.2	269.5	273.7	277.9	282.1	286.2
118.0	260.2	264.5	268.7	272.9	277.1	281.2	285.4
120.0	259.4	263.7	267.9	272.1	276.3	280.4	284.6
122.0	258.7	262.9	267.1	271.3	275.5	279.6	283.7
124.0	257.9	262.1	266.4	270.5	274.7	278.8	282.9
126.0	257.1	261.4	265.6	269.8	273.9	278.0	282.1
128.0	256.4	260.6	264.8	269.0	273.1	277.2	281.3
130.0	255.7	259.9	264.1	268.2	272.3	276.4	280.5

Table 11-5. Hydrogen Contents Table (SCF/cu ft) - Continued

°F	5700 psig	5800 psig	5900 psig	6000 psig
-40.0	375.8	380.7	385.5	390.3
-38.0	374.4	379.3	384.1	388.9
-36.0	373.0	377.8	382.6	387.4
-34.0	371.6	376.4	381.2	386.0
-32.0	370.2	375.0	379.8	384.5
-30.0	368.8	373.6	378.4	383.1
-28.0	367.4	372.2	377.0	381.7
-26.0	366.0	370.8	375.6	380.3
-24.0	364.7	369.5	374.2	378.9
-22.0	363.3	368.1	372.9	377.5
-20.0	362.0	366.8	371.5	376.2
-18.0	360.7	365.4	370.2	374.8
-16.0	359.4	364.1	368.8	373.5
-14.0	358.1	362.8	367.5	372.1
-12.0	356.8	361.5	366.2	370.8
-10.0	355.5	360.2	364.9	369.5
-8.0	354.2	358.9	363.6	368.2
-6.0	353.0	357.7	362.3	366.9
-4.0	351.7	356.4	361.0	365.6
-2.0	350.5	355.1	359.8	364.3
0.0	349.2	353.9	358.5	363.1
2.0	348.0	352.6	357.2	361.8
4.0	346.8	351.4	356.0	360.6
6.0	345.6	350.2	354.8	359.3
8.0	344.4	349.0	353.6	358.1
10.0	343.2	347.8	352.3	356.9
12.0	342.0	346.6	351.1	355.6
14.0	340.8	345.4	349.9	354.4
16.0	339.7	344.2	348.8	353.2
18.0	338.5	343.1	347.6	352.1
20.0	337.4	341.9	346.4	350.9
22.0	336.2	340.7	345.2	349.7
24.0	335.1	339.6	344.1	348.5
26.0	333.9	338.5	342.9	347.4
28.0	332.8	337.3	341.8	346.2
30.0	331.7	336.2	340.7	345.1
32.0	330.6	335.1	339.5	344.0
34.0	329.5	334.0	338.4	342.8
36.0	328.4	332.9	337.3	341.7
38.0	327.4	331.8	336.2	340.6
40.0	326.3	330.7	335.1	339.5
42.0	325.2	329.6	334.0	338.4
44.0	324.2	328.6	333.0	337.3
46.0	323.1	327.5	331.9	336.2

Table 11-5. Hydrogen Contents Table (SCF/cu ft) - Continued

°F	5700 psig	5800 psig	5900 psig	6000 psig
48.0	322.1	326.5	330.8	335.2
50.0	321.0	325.4	329.8	334.1
52.0	320.0	324.4	328.7	333.0
54.0	319.0	323.3	327.7	332.0
56.0	318.0	322.3	326.6	330.9
58.0	316.9	321.3	325.6	329.9
60.0	315.9	320.3	324.6	328.9
62.0	314.9	319.3	323.6	327.8
64.0	314.0	318.3	322.6	326.8
66.0	313.0	317.3	321.6	325.8
68.0	312.0	316.3	320.6	324.8
70.0	311.0	315.3	319.6	323.8
72.0	310.1	314.3	318.6	322.8
74.0	309.1	313.4	317.6	321.8
76.0	308.1	312.4	316.6	320.8
78.0	307.2	311.5	315.7	319.9
80.0	306.3	310.5	314.7	318.9
82.0	305.3	309.6	313.8	317.9
84.0	304.4	308.6	312.8	317.0
86.0	303.5	307.7	311.9	316.0
88.0	302.6	306.8	310.9	315.1
90.0	301.7	305.8	310.0	314.1
92.0	300.7	304.9	309.1	313.2
94.0	299.8	304.0	308.2	312.3
96.0	299.0	303.1	307.3	311.4
98.0	298.1	302.2	306.4	310.5
100.0	297.2	301.3	305.4	309.5
102.0	296.3	300.4	304.6	308.6
104.0	295.4	299.6	303.7	307.7
106.0	294.6	298.7	302.8	306.8
108.0	293.7	297.8	301.9	306.0
110.0	292.8	296.9	301.0	305.1
112.0	292.0	296.1	300.2	304.2
114.0	291.1	295.2	299.3	303.3
116.0	290.3	294.4	298.4	302.5
118.0	289.5	293.5	297.6	301.6
120.0	288.6	292.7	296.7	300.7
122.0	287.8	291.9	295.9	299.9
124.0	287.0	291.0	295.0	299.0
126.0	286.2	290.2	294.2	298.2
128.0	285.4	289.4	293.4	297.4
130.0	284.6	288.6	292.6	296.5

CHAPTER 12

CYLINDER REQUALIFICATION FACILITIES AND MANUFACTURERS OF COMPRESSED GAS CYLINDERS

12.1 PURPOSE.

The purpose of this chapter is to provide information on compressed gas cylinder requalification facilities.

12.2 REQUALIFICATION REQUIREMENTS.

Requalification (inspection, hydrostatic testing, and physical reconditioning) of compressed gas cylinders shall be performed by requalification facilities, which have been inspected and registered with the DOT. The method of obtaining the facility registration shall be determined by the location of the requesting facility. The facilities that are located within the United States, its territories, and possessions shall correspond directly with DOT to obtain the desired registration. The facilities which are located outside the United States, its territories, and its possessions (overseas locations) shall correspond through a designated military Office of Primary Responsibility (OPR) to DGSC. Documentation on registration for Air Force overseas facilities shall be submitted through WR-ALC/AFTT. DGSC has been authorized by DOT to act as an independent inspection agency to respond to all DoD request for registration of overseas facilities whether they are military or commercial.

12.3 RESPONSIBILITIES.

Facilities located within the USA, its territories, and possessions shall be registered with the DOT in the name of the requesting DoD activities or the commercial firm that will be performing the cylinder requalification. Facilities at an overseas location, either military service or commercial shall be registered in the name of the requesting DoD activity. The designated office within that activity shall be either the managing office of the military service facility or the managing office that is administering the contract requirements with the commercial firm performing the cylinder retesting and reconditioning. The request for registration and the completion of the application forms shall be accomplished and signed by a management representative of the commercial firm and the DoD activity.

12.4 PROCEDURES.

Procedures for obtaining a DOT Facility Registration are referenced in AFMAN 23-227 (AFJMAN 23-227).

12.5 DOT REGISTERED FACILITIES (OVERSEAS).

Table 12-1 is a list of DOT facilities registered with DOT and qualified in the inspection, hydrostatic testing, and physical reconditioning of compressed gas cylinders.

Table 12-1. Company Name or DoD Installation and Address

<p><u>CUBA</u></p> <p>U.S. Navy Shore Intermediate Maintenance Activity UIC 68712 Building #5, Guantanamo Bay, Cuba</p>
<p><u>ENGLAND</u></p> <ul style="list-style-type: none"> • Luxfer U.K., Ltd. Colwick, Nottingham N04 2BH, England • T.I. Chesterfield, Ltd. Chesterfield, Derbyshire S40 2EA, England • Ministry of Defense 217 Maintenance Unit Bldg 46 RAF Cardington Bedfordshire MK42 OTH
<p><u>GUAM</u></p> <p>U.S. Naval Ship Repair Facility Agana, Guam, Marianas Island C-930, X-31, Machinery Group Bldg 20 FPO San Francisco, CA 96630</p>
<p><u>HAWAII</u></p> <p>Hickam Air Force Base Fire Department 15ABW/DEF Bldg 3219 Kamakahi Road Hickam AFB, HI 96853</p>
<p><u>ICELAND</u></p> <p>U.S. Naval Station, Keflavik, Iceland (c/o Fire Department) Keflavik, Iceland FPO New York, NY 09571</p>
<p><u>JAPAN</u></p> <ul style="list-style-type: none"> • Showa Koatsu Kogyo Co., Ltd. No. 1-2 Iwanoto-Cho 3-Chome, Chiyoda-Ku Tokyo 101 Japan • U.S. Naval Supply Depot (Daiichi Kasei Sangyo Co.) Daiichi Kasei Sangyo, Funabashi City, JP FPO Seattle, WA 98762-1500 Yokosuka, Japan

Table 12-1. Company Name or DoD Installation and Address - Continued

<ul style="list-style-type: none"> • U.S. Naval Supply Depot (Daiichi Kasei Sangyo Co.) Wakayama Kogyo Co., Chiba City Japan FPO Seattle, WA 98762-1500 Yokosuka, Japan • U.S. Naval Supply Depot (Daiichi Kasei Sangyo Co. Ltd.) Daiichi Kasei Sangyo, Kawagoe City FPO Seattle, WA 98762-1500 Yokosuka, Japan • U.S. Naval Supply Depot (Teishin Sangyo Co. Ltd.) Tanabe Kogyo Co., Sagamihara City Japan FPO Seattle, WA 98762-1500 Yokosuka, Japan • U.S. Naval Supply Depot (Teishin Sangyo Co. Ltd.) Toho Yozai K.K., Yamato City, Japan FPO Seattle, WA 98762-1500 Yokosuka, Japan • U.S. Naval Ship Repair Facility (Yokosuka, Japan) Bldg A-48 1-1, Hon-cho, Yokosuka, Box 8 FPO Seattle, WA 98762-1400 • Tohsan Co. Ltd. Hachinohe Branch 75-7, Tenguyanogi, Noganawashiro Hachinohe-shi, Aomori-ken, Japan APO San Francisco, CA 96519-5320 • Daiichi Kaimei Co. Ltd. Hachinohe Branch 19-7, Nakajima, Kawaragi Hachinohe-shi, Aomori-ken, Japan San Francisco, CA 96519-5320
<p><u>JOHNSTON ISLAND</u></p> <p>Holmes & Narver, Inc. Johnston Atoll APO San Francisco, CA 96305</p>
<p><u>KOREA</u></p> <ul style="list-style-type: none"> • U.S. Army Korea Contracting Agency Shin Yang Oxygen Ltd., Seoul, Korea Attn: EAKC-CS APO San Francisco, CA 96301

Table 12-1. Company Name or DoD Installation and Address - Continued

<ul style="list-style-type: none"> • U.S. DoD, Army Material Support Center Bldg S-405, Camp Carroll, Waegwan Korea Attn: EANC-MSC APO San Francisco, CA 96460
<p><u>MARSHALL ISLANDS</u></p> <p>U.S. DoD, Kwajalein Missile Range (Global Associates) Kwajalein Missile Range – Marshall Island P.O. Box 26 Attn: BMDSC-RKS APO San Francisco, CA 96555-2526</p>
<p><u>NEW ZEALAND</u></p> <ul style="list-style-type: none"> • New Zealand Industrial Gases Ltd. 21-27 Epson Road, Sockburn Christchurch, New Zealand • U.S. Naval Support Force, Antarctica Detachment Christchurch FPO San Francisco, CA 96690
<p><u>PHILIPPINES</u></p> <ul style="list-style-type: none"> • U.S. DoD, U.S. Naval Ship Repair Facility Subic Bay, Zambales, Rep. of Philippines Box 34 FPO San Francisco, CA 96651 • U.S. Naval Ship Repair Facility Subic Bay, Subic Naval Base, Philippines • U.S. Naval Supply Depot (Ingasco Inc.) 20-12th Ave. Calloocan City, Phillipines Box 33, Code 200 FPO San Francisco, CA 96651
<p><u>PORTUGAL</u></p> <p>Naval Aviation Logistics Center European Repair and Rework Activity Representative 2615 Alverca Do Ribatego, Alverca, Portugal APO New York, NY 09678</p>
<p><u>WEST GERMANY</u></p> <p>Kammerich-Reicholz GMBH Karlsruhe 23-25, Dinslaken 4220 West Germany</p>

CHAPTER 13

NATO STANDARDIZATION AGREEMENT (STANAG) AND APPLICABLE INFORMATION

13.1 PURPOSE.

The purpose of this chapter is to provide a document for implementing NATO Standardization (STANAG) requirements. The following requirements do not apply to compressed gas cylinders used by the U.S. Air Force organizations during normal operations. The intent of STANAG 7146 is to provide an agreed method of marking ground storage compressed gas cylinders and cryogenic containers used in cross-servicing operations with NATO organizations.

13.2 STANAG 7146 ASSIGNMENT OF NATO CODE NUMBERS TO GASES USED IN AIRCRAFT CROSS-SERVICING.

This chapter contains the NATO Gas Codes assigned to compressed and cryogenic gases in STANAG 7146, Edition 2. Table 13-1 contains the related and additional reference documents for STANAG 7146. Table 13-2 contains the NATO Code Numbers, the product description, the U.S. implementing document, the applicable STANAG, and the AFTO Tags that should be used to identify these aircraft servicing gases for NATO purposes. NATO members can order these tags through Foreign Military Sales.

The information contained in Table 13-2 may not be the latest and the table should be referred to for reference only.

13.3 CYLINDER STENCILING REQUIREMENTS.

Air Force compressed gas cylinder color coding and stenciling will be accomplished in accordance with MIL-STD-101. The name of the gas will be stenciled parallel to the longitudinal axis of the cylinder on 2 locations diametrically opposite of each other. It is recommended that the titles be applied by use of upper case letters and arabic numerals whenever applicable. On cylinders 4 inches in diameter and larger the title shall be in approximately 2-inch high letters. On cylinders less than 4 inches in diameter, letters may be reduced in size. Where a title includes a modifier, such as MEDICAL or OIL FREE, the modifier shall follow the chemical designation and should be shown in letters approximately $\frac{3}{4}$ as high. Cylinders having a background color of yellow, orange, or buff shall have title painted with black letters. Cylinders having a background color of red, brown, blue, gray, green, or black shall have the title painted with white letters. Mixtures of 2 or more gases shall show the percent of each gas as part of the title.

Table 13-1. Related and Additional Documents

NATO Document Number	NATO Document Title
STANAG 7106	CHARACTERISTICS OF GASEOUS BREATHING OXYGEN, LIQUID BREATHING OXYGEN AND SUPPLY PRESSURE AND HOSES
STANAG 3610	CHARACTERISTICS OF CONDITIONED BREATHABLE AIR SUPPLIED TO AIRCRAFT ON THE GROUND
STANAG 3624	NITROGEN AND REPLENISHMENT EQUIPMENT CHARACTERISTICS
STANAG 7127	CHARACTERISTICS OF HIGH QUALITY GASEOUS AND LIQUID ARGON FOR ALL APPLICATIONS
STANAG 3104	IDENTIFICATION OF AIRCRAFT AND MISSILE PIPELINES AND ELECTRICAL CONDUITS
STANAG 3109	SYMBOL MARKING OF AIRCRAFT SERVICING AND SAFETY/HAZARD POINTS

Table 13-2. NATO Codes for Gases Used in Aircraft Cross-Servicing per STANAG 7146

NATO Code Number	Product Description	U.S. Specification	NATO STANAG	AFTO Tag Number
AIR-2012	Air, Compressed Breathing	BB-A-1034	STANAG 3610	AFTO 480
A-2013	Argon, Gaseous	MIL-PRF-27415, Type I	STANAG 7127	AFTO 488
A-2014	Argon, Liquid	MIL-PRF-27415, Type II	STANAG 7127	AFTO 487
N-2102	Nitrogen, Gaseous (oil-free)	A-A-59503, Type I, Class 1	STANAG 3624	AFTO 486
N-2103	Nitrogen, Gaseous (oil tolerant)	A-A-59503, Type I, Class 2	Not Covered	AFTO 485
N-2104	Nitrogen, Liquid	A-A-59503, Type II	STANAG 3624	AFTO 484
ABO-2202	Oxygen, Gaseous Aviator's Breathing Oxygen	MIL-PRF-27210, Type I	STANAG 7106	AFTO 483
MEDOX-2203	Oxygen, Gaseous Medical	U.S. Pharmacopeia Medical Grade	Not Covered	AFTO 482
ABO-2204	Oxygen, Liquid Aviator's Breathing Oxygen	MIL-PRF-27210, Type II	STANAG 7106	AFTO 481
OX-2205	Oxygen, Gaseous Chemical Generator	AFGS 87226A	Not Covered	Not Applicable